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Smithsonian

{ FEBRUARY 2007 }

DEATH IN HAPPY VALLEY

In Kenya, the shooting of a dirt-poor black man by a wealthy white landowner highlights the strains wrought by an exploding population on this mythic land

Those Over-the-Top Pre-Raphaelites Masking the Wounds of World War I

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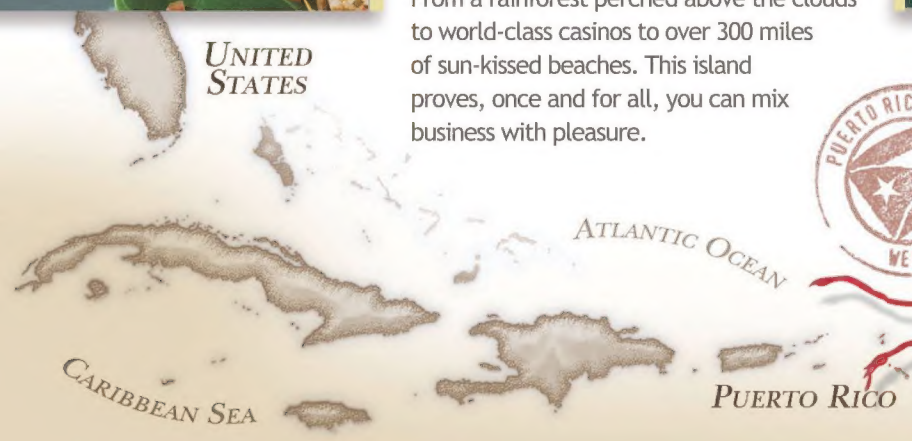

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PUERTO RICO

Smithsonian features

{ FEBRUARY 2007 · VOLUME 37, NUMBER 11 }

If the bag's stench reinforces one's stereotypes about the repugnance of vultures, the chick that emerges dispels them. Up close, the baby is a beauty—the bare skin of its swan neck palest aqua, its pinfeathers a wild duck's browns. **"THE VANISHING,"** PAGE 64

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Shocking violence around the lakes of Kenya's Great Rift Valley, including two high-profile killings by the same white rancher, highlights an escalating population crisis

BY RICHARD CONNIFF / PHOTOGRAPHS BY PER-ANDERS PETTERSSON

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The immunity from prosecution that Gerald Ford granted Richard Nixon for his role in Watergate may have helped the nation heal, but it likely cost Ford a second term. Here, a detailed account of the late president's momentous decision

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Why have large vultures on the Indian subcontinent—once numbering in the tens of millions—suddenly become endangered?

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In an inspiring response to World War I's merciless trench warfare, a few sculptors and artists rose to the challenge of creating lifelike masks for gravely wounded soldiers

BY CAROLINE ALEXANDER

82 Ahead in the Clouds

Susan Solomon helped solve the riddle of the ozone hole 21 years ago. Now she's taking on global warming

BY VIRGINIA MORELL

86 Incurably Romantic

Dismissed as overly sentimental for much of the 20th century, the luminous works of Britain's Pre-Raphaelite painters are now finding new fans

BY DOUG STEWART

THIS PAGE: Large vultures (two juveniles at a breeding center) serve as sanitation engineers in Nepal, India and Pakistan. The birds can pick a cow carcass clean in under 30 minutes. Photograph by Ami Vitale.

COVER: Jokim Githuka, 3, holds a portrait of his dead father, killed by a member of the colonial aristocracy now on trial. Photograph by Per-Anders Pettersson.

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As a group, the painters were drawn to working-class women, many of whom were happy to model—unchaperoned—for a shilling an hour.

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Listen, readers, and you shall hear, there's more to Longfellow than Paul Revere. Or so scholars are finding on the 200th anniversary of the celebrity poet's birth
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THIS PAGE: The Pre-Raphaelite painters looked to early literature—the Bible, Chaucer, the tales of King Arthur—for inspiration (*Mary Magdalene*, c. 1859, by Frederick Sandys). Samuel and Mary R. Bancroft Memorial, 1935. Delaware Art Museum.

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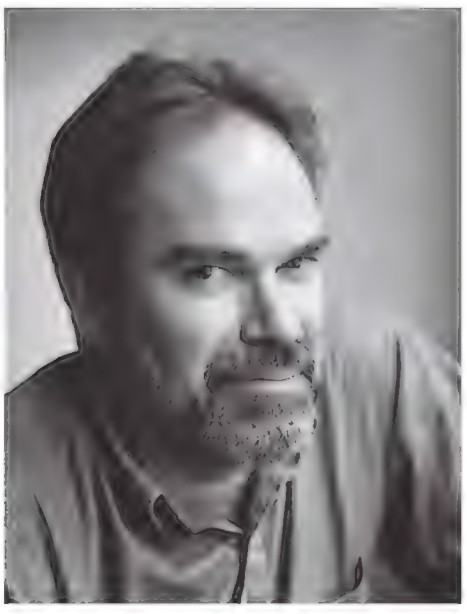
FROM THE EDITOR

Trial and Tribulations

Reordering lives through the barrels of guns **BY CAREY WINFREY**

RICHARD CONNIFF, author of our story "Death in Happy Valley" (p. 40), has written for SMITHSONIAN since 1982 and has been going to Africa for more than a decade, reporting mostly about wildlife conservation. What took him there this time was the case of Tom Cholmondely (pronounced Chumley), the fourth-generation white Kenyan accused of killing a black poacher on Cholmondely's property (his second shooting in as many years). "Cholmondely had come across in the press as living a leisurely, land-owning life," Conniff says, but the reporter found that the story was much richer than that. "Cholmondely may be, as a neighbor said, a trigger-happy guy acting beyond the law. But I found that he was also passionate about wildlife and seemed to have a good relationship with many of his black neighbors. So that was surprising."



Conniff: The situation in Kenya "can't keep on like this."

Once in Kenya, Conniff confronted the consequences of that nation's exploding population and its effect on the environment and wildlife. "If you've stripped the forest and overexploited the water resources, then it's going to be an environmental catastrophe, and people are going to die. Right now people can't feed their families, and they have to turn to crime because there's no other way to make a living in some of these areas."

The trial, suspended over the Christmas and New Year holidays, is slated to resume this month. "I don't know what will happen," says Conniff. "But I had an interesting conversation with some members of the Muthaiga Country Club—which is primarily for the Euro community. The older generation there said, 'He'll get off, they *have* to let him off,' while the younger generation said they ought to put him away."

CAROLINE ALEXANDER, whose book about famed Antarctic explorer Ernest Shackleton, *The Endurance*, was a bestseller, learned about masks made for disfigured World War I soldiers (see "Faces of War," p. 72) from the diaries of Kathleen Scott, the widow of another famous polar explorer, Capt. Robert Scott. "Through her I found out that there was this whole program in England that co-opted the country's artists, putting them to use helping with this radical new facial reconstruction." She attributes her fascination with the masks to their compelling suggestive power. "They represent an act of desperate improvisation, and these men were living metaphors of the horror of that war, and all wars, which is that you put a pretty cover on it and send the people away and say, well that's great, now we've fixed it. But you can't really fix it."

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IMPORTANT SAFETY INFORMATION: LUNESTA works quickly, and should be taken right before bed. Be sure you have at least eight hours to devote to sleep before becoming active. Until you know how you'll react to prescription LUNESTA, you should not drive or operate machinery. Do not use alcohol while taking LUNESTA. Most sleep medicines carry some risk of dependency. Side effects may include unpleasant taste, headache, drowsiness and dizziness. See important patient information on the next page.

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Please read this summary of information about LUNESTA before you talk to your doctor or start using LUNESTA. It is not meant to take the place of your doctor's instructions. If you have any questions about LUNESTA tablets, be sure to ask your doctor or pharmacist.

LUNESTA is used to treat different types of sleep problems, such as difficulty in falling asleep, difficulty in maintaining sleep during the night, and waking up too early in the morning. Most people with insomnia have more than one of these problems. You should take LUNESTA immediately before going to bed because of the risk of falling.

LUNESTA belongs to a group of medicines known as "hypnotics" or, simply, sleep medicines. There are many different sleep medicines available to help people sleep better. Insomnia is often transient and intermittent. It usually requires treatment for only a short time, usually 7 to 10 days up to 2 weeks. If your insomnia does not improve after 7 to 10 days of treatment, see your doctor, because it may be a sign of an underlying condition. Some people have chronic sleep problems that may require more prolonged use of sleep medicine. However, you should not use these medicines for long periods without talking with your doctor about the risks and benefits of prolonged use.

Side Effects

All medicines have side effects. The most common side effects of sleep medicines are:

- Drowsiness
- Dizziness
- Lightheadedness
- Difficulty with coordination

Sleep medicines can make you sleepy during the day. How drowsy you feel depends upon how your body reacts to the medicine, which sleep medicine you are taking, and how large a dose your doctor has prescribed. Daytime drowsiness is best avoided by taking the lowest dose possible that will still help you sleep at night. Your doctor will work with you to find the dose of LUNESTA that is best for you. Some people taking LUNESTA have reported next-day sleepiness.

To manage these side effects while you are taking this medicine:

- When you first start taking LUNESTA or any other sleep medicine, until you know whether the medicine will still have some effect on you the next day, use extreme care while doing anything that requires complete alertness, such as driving a car, operating machinery, or piloting an aircraft.
- Do not drink alcohol when you are taking LUNESTA or any sleep medicine. Alcohol can increase the side effects of LUNESTA or any other sleep medicine.
- Do not take any other medicines without asking your doctor first. This includes medicines you can buy without a prescription. Some medicines can cause drowsiness and are best avoided while taking LUNESTA.
- Always take the exact dose of LUNESTA prescribed by your doctor. Never change your dose without talking to your doctor first.

Special Concerns

There are some special problems that may occur while taking sleep medicines.

Memory Problems

Sleep medicines may cause a special type of memory loss or "amnesia." When this occurs, a person may not remember what has happened for several hours after taking the medicine. This is usually not a problem since most people fall asleep after taking the medicine. Memory loss can be a problem, however, when sleep medicines are taken while traveling, such as during an airplane flight and the person wakes up before the effect of the medicine is gone. This has been called "traveler's amnesia." Memory problems have been reported rarely by patients taking LUNESTA in clinical studies. In most cases, memory problems can be avoided if you take LUNESTA only when you are able to get a full night of sleep before you need to be active again. Be sure to talk to your doctor if you think you are having memory problems.

Tolerance

When sleep medicines are used every night for more than a few weeks, they may lose their effectiveness in helping you sleep. This is known as "tolerance." Development of tolerance to LUNESTA was not observed in a clinical study of 6 months' duration. Insomnia is often transient and intermittent, and prolonged use of sleep medicines is generally not necessary. Some people, though, have chronic sleep problems that may require more prolonged use of sleep medicine. If your sleep problems continue, consult your doctor, who will determine whether other measures are needed to overcome your sleep problems.

Dependence

Sleep medicines can cause dependence in some people, especially when these medicines are used regularly for longer than a few weeks or at high doses. Dependence is the need to continue taking a medicine because stopping it is unpleasant.

When people develop dependence, stopping the medicine suddenly may cause unpleasant symptoms (see *Withdrawal* below). They may find they have to keep taking the medicine either at the prescribed dose or at increasing doses just to avoid withdrawal symptoms.

All people taking sleep medicines have some risk of becoming dependent on the medicine. However, people who have been dependent on alcohol or other drugs in the past may have a higher chance of becoming addicted to sleep medicines. This possibility must be considered before using these medicines for more than a few weeks. If you have been addicted to alcohol or drugs in the past, it is important to tell your doctor before starting LUNESTA or any sleep medicine.

Withdrawal

Withdrawal symptoms may occur when sleep medicines are stopped suddenly after being used daily for a long time. In some cases, these symptoms can occur even if the medicine has been used for only a week or two. In mild cases, withdrawal symptoms may include unpleasant feelings. In more severe cases, abdominal and muscle cramps, vomiting, sweating, shakiness, and, rarely, seizures may occur. These more severe withdrawal symptoms are very uncommon. Although withdrawal symptoms have not been observed in the relatively limited controlled trials experience with LUNESTA, there is, nevertheless, the risk of such events in association with the use of any sleep medicine.

Another problem that may occur when sleep medicines are stopped is known as "rebound insomnia." This means that a person may have more trouble sleeping the first few nights after the medicine is stopped than before starting the medicine. If you should experience rebound insomnia, do not get discouraged. This problem usually goes away on its own after 1 or 2 nights.

If you have been taking LUNESTA or any other sleep medicine for more than 1 or 2 weeks, do not stop taking it on your own. Always follow your doctor's directions.

Changes In Behavior And Thinking

Some people using sleep medicines have experienced unusual changes in their thinking and/or behavior. These effects are not common. However, they have included:

- More outgoing or aggressive behavior than normal
- Confusion
- Strange behavior
- Agitation
- Hallucinations
- Worsening of depression
- Suicidal thoughts

How often these effects occur depends on several factors, such as a person's general health, the use of other medicines, and which sleep medicine is being used. Clinical experience with LUNESTA suggests that it is rarely associated with these behavior changes.

It is also important to realize it is rarely clear whether these behavior changes are caused by the medicine, are caused by an illness, or have occurred on their own. In fact, sleep problems that do not improve may be due to illnesses that were present before the medicine was used. If you or your family notice any changes in your behavior, or if you have any unusual or disturbing thoughts, call your doctor immediately.

Pregnancy And Breastfeeding

Sleep medicines may cause sedation or other potential effects in the unborn baby when used during the last weeks of pregnancy. Be sure to tell your doctor if you are pregnant, if you are planning to become pregnant, or if you become pregnant while taking LUNESTA.

In addition, a very small amount of LUNESTA may be present in breast milk after use of the medication. The effects of very small amounts of LUNESTA on an infant are not known; therefore, as with all other prescription sleep medicines, it is recommended that you not take LUNESTA if you are breast-feeding a baby.

Safe Use Of Sleep Medicines

To ensure the safe and effective use of LUNESTA or any other sleep medicine, you should observe the following cautions:

1. LUNESTA is a prescription medicine and should be used ONLY as directed by your doctor. Follow your doctor's instructions about how to take, when to take, and how long to take LUNESTA.
2. Never use LUNESTA or any other sleep medicine for longer than directed by your doctor.
3. If you notice any unusual and/or disturbing thoughts or behavior during treatment with LUNESTA or any other sleep medicine, contact your doctor.
4. Tell your doctor about any medicines you may be taking, including medicines you may buy without a prescription and herbal preparations. You should also tell your doctor if you drink alcohol. DO NOT use alcohol while taking LUNESTA or any other sleep medicine.
5. Do not take LUNESTA unless you are able to get 8 or more hours of sleep before you must be active again.
6. Do not increase the prescribed dose of LUNESTA or any other sleep medicine unless instructed by your doctor.
7. When you first start taking LUNESTA or any other sleep medicine, until you know whether the medicine will still have some effect on you the next day, use extreme care while doing anything that requires complete alertness, such as driving a car, operating machinery, or piloting an aircraft.
8. Be aware that you may have more sleeping problems the first night or two after stopping any sleep medicine.
9. Be sure to tell your doctor if you are pregnant, if you are planning to become pregnant, if you become pregnant, or if you are breastfeeding a baby while taking LUNESTA.
10. As with all prescription medicines, never share LUNESTA or any other sleep medicine with anyone else. Always store LUNESTA or any other sleep medicine in the original container and out of reach of children.
11. Be sure to tell your doctor if you suffer from depression.
12. LUNESTA works very quickly. You should only take LUNESTA immediately before going to bed.
13. For LUNESTA to work best, you should not take it with or immediately after a high-fat, heavy meal.
14. Some people, such as older adults (i.e., ages 65 and over) and people with liver disease, should start with the lower dose (1 mg) of LUNESTA. Your doctor may choose to start therapy at 2 mg. In general, adults under age 65 should be treated with 2 or 3 mg.
15. Each tablet is a single dose; do not crush or break the tablet.

Note: This summary provides important information about LUNESTA. If you would like more information, ask your doctor or pharmacist to let you read the Prescribing Information and then discuss it with him or her.

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LETTERS READERS RESPOND TO THE **DECEMBER** ISSUE

WAGING PEACE IN THE PHILIPPINES
BY ELIZA GRISWOLD
Smithsonian
Novelist Paul Theroux on living with geese, "gushing anthropomorphism" and E. B. White's "deficiency of observation"

Author Paul Theroux should pause before he concludes animals cannot be cheerful ("Living with Geese"). There are happy dogs and mean ones, just as there are happy and mean people. It's not a simple matter to distinguish our "human" from our "animal" behavior.

WILLIAM HUHN GUILFORD. CONNECTICUT

FOWL LANGUAGE

AS THE EDITOR OF the just-released *Letters of E. B. White, Revised Edition* and as his granddaughter, let me reassure Mr. Theroux that White observed geese by night, as well as by day. I was the occasional recipient of a nighttime tour of the barn to visit the hens at roost and the geese (Embdens) on alert. White was both pragmatic and sentimental about geese. A gift of a down-filled sleeping bag, in 1971, came with a comment: "If it contains grey goose down, it's practically a member of the family—I've known grey geese even longer than I've known you." White knew geese depended on him for food, but the feeling was mutual, as our Christmas dinners sometimes proved. Penned at night for their protection, his geese enjoyed daytime access to acres of pasture and long flights to the pond.

Taking a scientific view of barnyard animals is one way to write; using them as a literary device is another. White did both, according to his purpose. He lost his battle with moviemakers who wanted to portray singing pigs and spiders that batted their eyelashes. Still, it was no "gushing anthropomorphism" when he trusted children to love the natural world, where Charlotte A. Cavatica speaks about trapping bugs to drink their blood and explains her anatomy by naming all seven sections of her legs. Theroux slips into personal essay himself, when he describes his geese as "meddling," "impatient," "affectionate," "ingenious," and, like his geese, he sometimes comes to an amusing but "wrongheaded" conclusion. Geese, like dogs, reflect the sensitivities of their owners. If Theroux's Oahu geese are "goosish," so be it.

MARTHA WHITE
ROCKPORT, MAINE

I CAN'T AGREE with Theroux's objection to anthropomorphism in E. B. White's children's books. Assigning human qualities to animals is an effective and entertaining way of teaching children about themselves, relationships, and moral and ethical issues. It also can help teach them a respect for all forms of life that may later be redirected into a more realistic and scientific appreciation of animals.

CLEM H. UNDERHILL
EL CERRITO, CALIFORNIA

THE NOTION THAT social bonding within or across species results from access to "easy food," as Theroux purports, was refuted decades ago by social scientists and clinicians who observed that infant animals and human beings raised with adequate nutritional provisions but deficient social nurturance (i.e., parental comfort and protection) suffered severe developmental consequences. From my own experience, the stray cat that adopted my porch as home did so soon after I began petting her, but weeks before I began feeding her.

KRISTINE A. MUNHOLLAND
PORTLAND, OREGON

FORMER MARINES

AS A FORMER jarhead with the First Marine Division, the photo on page 92 ("Waging Peace in the Philippines") caught my eye. I am puzzled by an Army sergeant wearing the patch of the First Marine Division. Can you clarify this for me?

BOB MCNATT
WOODBRIDGE, CALIFORNIA

Yes. The Army Special Operations soldier in the photograph is authorized to wear the patch because he is a former U.S. Marine. —Ed.

CORRECTION:
A timeline on page 86 misstated the reason that Philippines president Corazon Aquino left office in 1992. She did not run for reelection.

Please send letters to LettersEd@si.edu or to **Letters, Smithsonian, MRC 951, P.O. Box 37012, Washington, D.C. 20013.** Include a telephone number and address. Letters may be edited for clarity or space. Because of the high volume of mail we receive, we cannot respond to all letters. Send queries about the Smithsonian Institution to info@si.edu or to VIARC, Public Inquiry Mail Service, P.O. Box 37012, Washington, D.C. 20013.

WILD THINGS

LIFE AS WE KNOW IT

ROADS TO RUIN

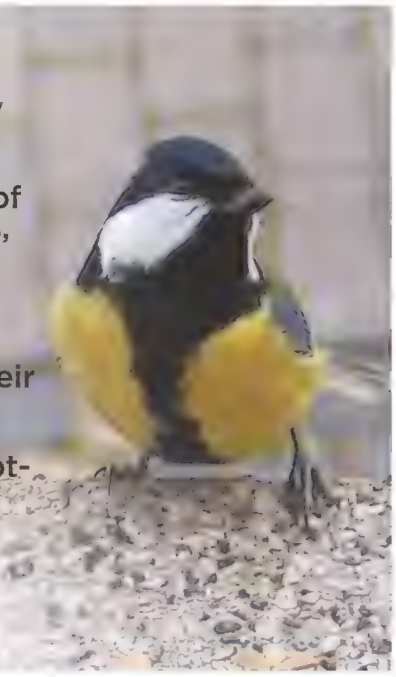
When pastures and roads carve up a forest, even trees that aren't chopped down suffer. That's one finding from the world's longest (22 years) and largest (32,000 trees) study of forest fragmentation, conducted in the Amazon by the Smithsonian Tropical Research Institute. Trees that grow slowly or prefer shade are especially weakened; many that were once surrounded by dense rain forest are felled by windstorms.

MAMMALS CATCH BIRDS IN FLIGHT

Mammals have been flying as long as birds, according to research on a newfound fossil. A flying squirrel-like glider called *Volaticotherium antiquus* (ancient gliding beast, illustrated above) from Inner Mongolia lived 125 million years ago—about 70 million years before any other mammal is known to have taken flight, bats included. Gliding, says paleontologist Jin Meng of the American Museum of Natural History in New York City, saves having to climb up and down to move from tree to tree.

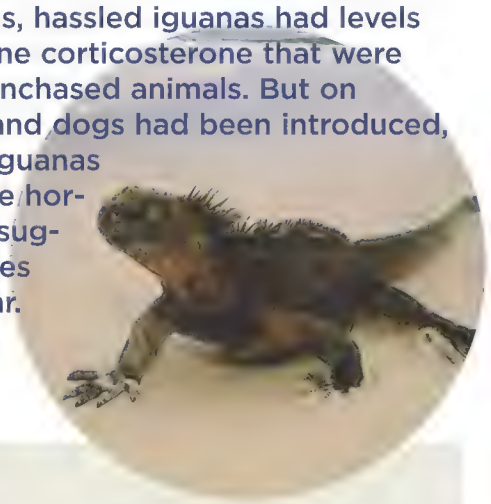
STREET MUSIC

More evidence that life in the big city can change a creature's tune: researchers from Leiden University in the Netherlands analyzed the songs of great tits, birds related to chickadees, in ten European cities, including London, Berlin and Paris. Compared with great tits in nearby forest sites, the urban birds sang faster and at a higher pitch—presumably to make their voices heard over the low-frequency din. The study suggests not only that these songbirds are surprisingly adaptable but also that there's a good reason city dwellers can be shrill.



KEEPING COOL

Why did scientists chase dozens of marine iguanas on the Galápagos Islands? To learn why island animals with no predators tend to be so calm. After subjecting the three-foot-long reptiles to 15 minutes each of "experimental harassment," the researchers, from Princeton and other universities, captured the animals and took blood samples. On predator-free islands, hassled iguanas had levels of the stress hormone corticosterone that were similar to those in unchased animals. But on islands where cats and dogs had been introduced, researcher-chased iguanas released more of the hormone. That finding suggests that the reptiles are able to learn fear.



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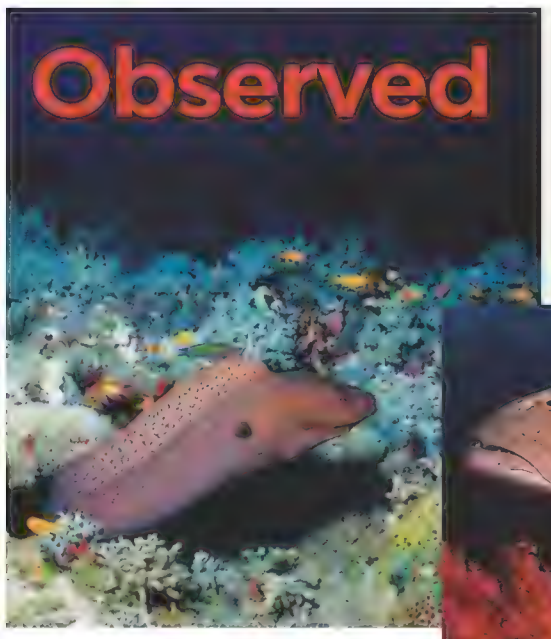

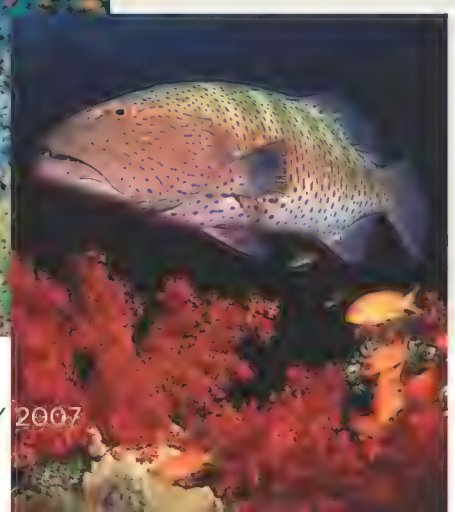

NAME: *Gymnothorax javanicus*, the giant moray eel, and *Plectropomus pessuliferus*, a grouper

FORMERLY SEEN AS: Crevice lurker and bottom dweller, respectively

NOW SEEN AS: Huntin' buddies. A new study has found that they seek prey jointly, a behavior rarely seen among mammals and never among fish. They have complementary skills, with the grouper preying in open water and the moray within coral reefs; working together, they leave their targets no place to run or hide.

ISN'T IT JUST A COINCIDENCE? No. The grouper, when hungry, gives the moray a special head shake, according to Redouan Bshary of the University of Neuchâtel in Switzerland. More often than not, the moray responds by joining forces with the grouper.

DO THEY SHARE? No. When either partner catches a fish, it swallows the prey whole. This prevents the predators from fighting over the spoils and may be the key to the evolution of such coordinated hunting.

Watch cooperative hunting and listen to city birds at Smithsonian.com.

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Fallen Giant

"A whole lifetime was over," legendary quarterback Y. A. Tittle recalls **BY MICHAEL SHAPIRO**

THE GREEK POET Pindar had wonderful things to say about heroes but less about defeat. So a couple of millennia later, Dianne Tittle de Laet, herself a poet as well as a classical scholar, was left to make sense of this image of her father, the New York Giants quarterback Y. A. Tittle.

The photograph captures a moment on a Sunday afternoon in Pittsburgh in September 1964. For three years, Tittle had led the Giants to the National Football League championship game, only to lose each time. He had been the league's Most Valuable Player in 1963. He was also a football ancient—38 years old—and looked it.

On the play preceding this moment, he had thrown a screen pass that was intercepted and returned for a touchdown. He had held his arms high as he threw. John Baker, a 270-pound defensive end for the Steelers, drove his helmet into Tittle's sternum and slammed him to the turf. A fair, if brutal, hit. Tittle could not breathe.

Still, being hurt was nothing new. Tittle had played organized football since the sixth grade in East Texas and had suffered a partially collapsed lung, a broken left hand (mercifully, he's a righty), a crushed cheekbone, broken fingers, fractured vertebrae, separated shoulders and muscles torn so deeply they took months to heal. "Every injury I ever had in my lifetime, I could tape it," he says. "Every injury I ever had, I could Novocain it." Not this time; the pain he felt now was different.

An X-ray revealed no broken bones. But his ribs were bruised, and the muscle was torn from his rib cage. He spent the night following the game in a hospital. And he played the following Friday.

He had lived his life refusing to give in to pain because, he recalls, "If you say something, they're going to get the next guy to do your job, and he may do it better." But when he returned to the game after this injury, he was not the same quarterback, as became ever more apparent as the season unfolded. The pain "made me one thing I never was," he says. "It made me gunshy. For the first time in my life I didn't want to get hit, because I couldn't get up."

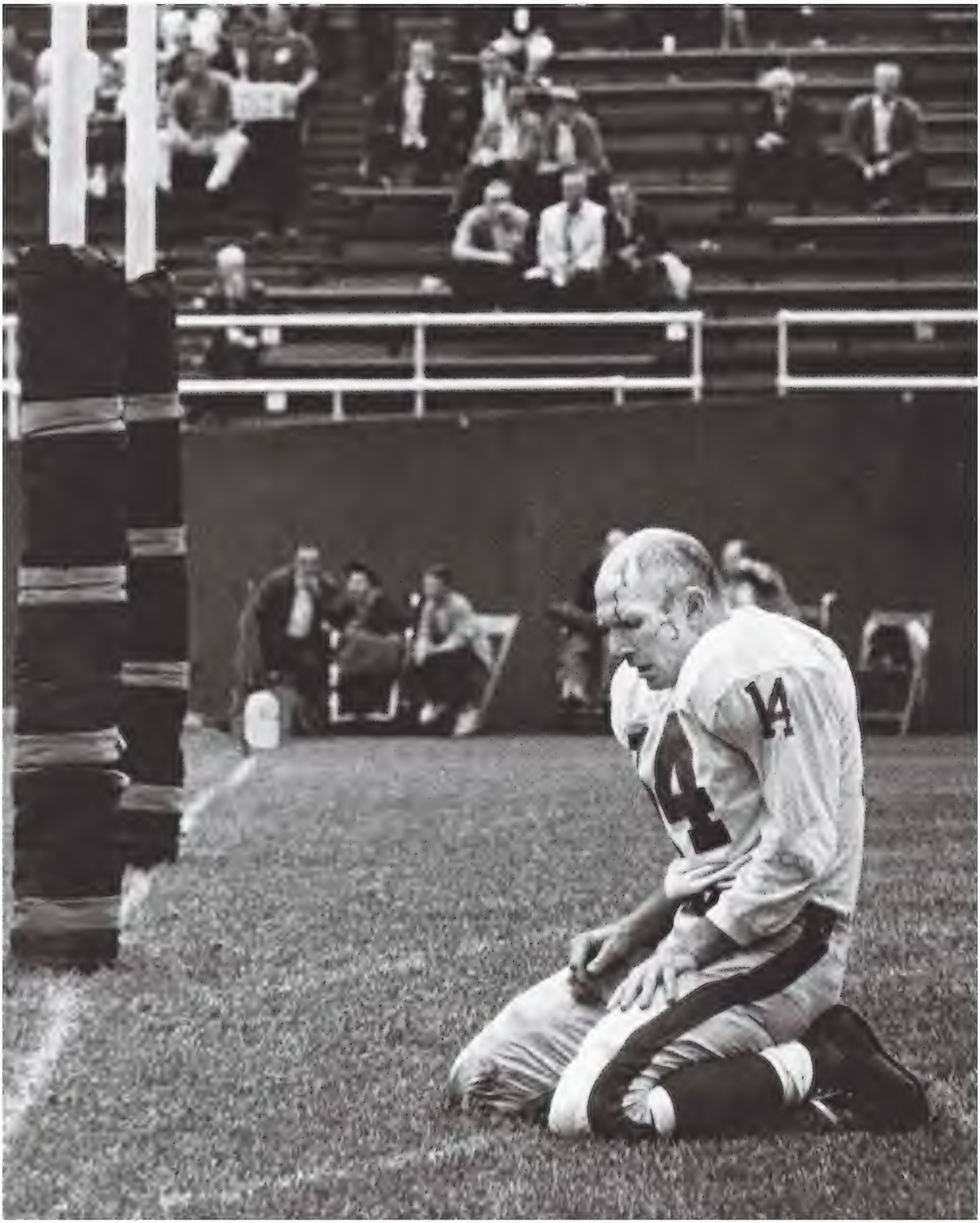
If you couldn't get up, you couldn't play. And if you couldn't play, he says, "you're no place."

The season ended. The Giants had gone 2-10-2. Tittle retired. When he considered a comeback the following season—his injuries had healed—his wife advised him against making a fool of himself. Instead, he went into the insurance business. He entered pro football's Hall of Fame in 1971.

When I met with Tittle recently, he smiled and acknowledged that what people recall first about him is this image—which did not immediately make it into print. It was taken by Morris Berman of the *Pittsburgh Post-Gazette*, who had made his reputation as a combat photographer (his next-most-famous photograph is of the bullet-riddled corpses of Mussolini and his mistress). Berman, who died in 2002 at age 92, had gone to Pitt Stadium that day not to cover the game but looking for human interest. He decided to focus on Tittle. But his editor, wanting an action photo, refused to run the injured warrior photograph. It became widely seen only after Berman entered it in contests. (It was chosen the best sports photograph in the National Headliner Award competition of 1964.) Now, it is one of only three pictures hanging in the lobby of the National Press Photographers Association headquarters in Durham, North Carolina, alongside Joe Rosenthal's photograph of the flag-raising at Iwo Jima and the image of the

In his picture of Y. A. Tittle, Morris Berman (inset, in 2000) captured the vanquished warrior's bloody struggle. But the now-classic photograph wasn't even published at first.

MORRIS BERMAN / MARTIN GORDON GALLERY; P 14. PAOLO VESCIA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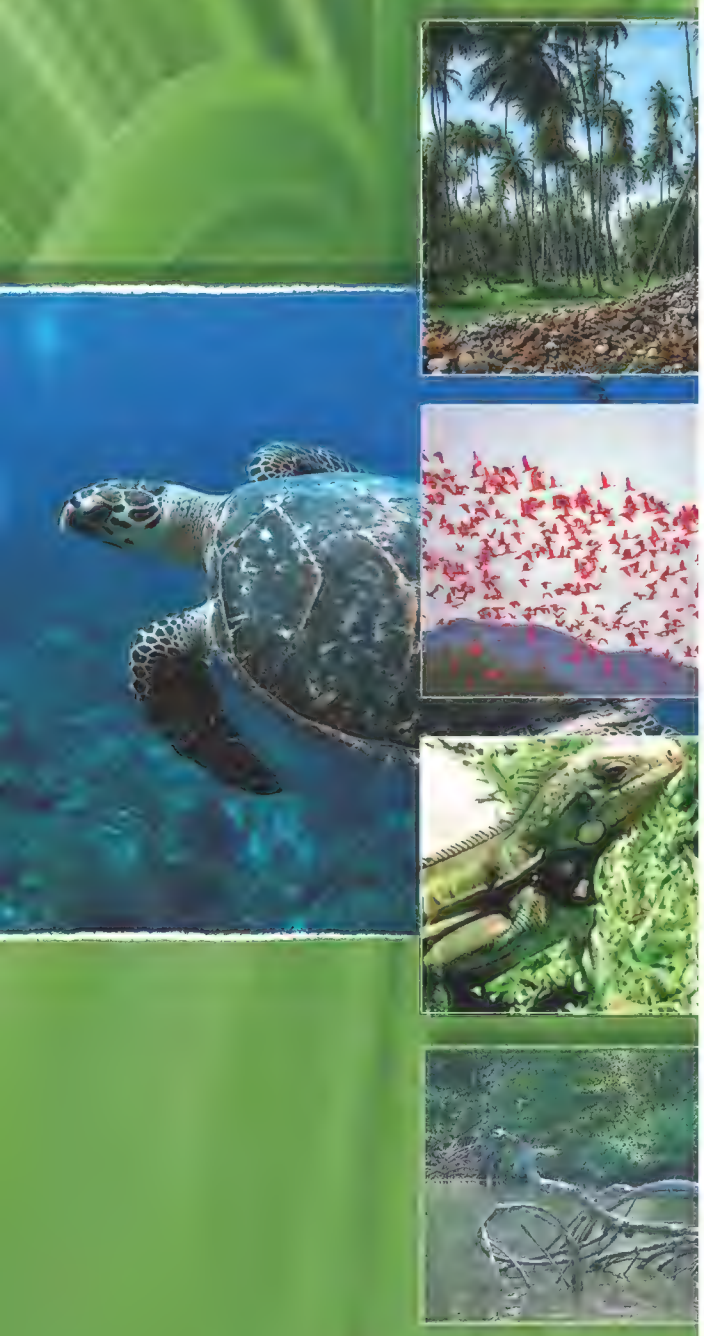

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EDWARD CALDWELL

Y. A. Tittle (at his home in Atherton, California, this past December) has said that although he never won a championship, he did win "in the long run," thanks to his family (from left, granddaughter Elisa de Laet Jagerson; great-granddaughter Taj; his wife, Minnette Tittle; great-granddaughter Ayla; and daughter Dianne de Laet).

death of the *Hindenburg* dirigible at Lakehurst, New Jersey.

Tittle, at 80, is vigorous, thick around the middle, broad across the chest and arms. He looks at Berman's photograph and says: "That was the end of my dance. A whole lifetime was over." A good and prosperous life came afterward—four children, nine grandchildren and great-grandchildren. And yet, he says, "Fall is still the saddest part of the year for me. It's because the leaves are turning, and if the leaves are turning, we're getting ready to play Longview or Tyler."

Dianne Tittle de Laet understands the longing and appreciates the sense of incompletion that comes with having such a photograph as her father's legacy. But she does not see a fallen hero in it. Instead, she sees mythical figures—"Hector, and Beowulf going out to meet Grendel," because "myths are about struggle."

Several years ago she wrote a book, *Giants & Heroes*, that tells how it felt to grow up with a father who, depending on the week, was celebrated or vilified. She did not write about this photograph, at least not directly. Rather, she says, the whole book is about that image. "It shows someone who is broken and maybe beaten. But at the same time it captures who my father was," she says. "It shows the want. I think my father wanted. And he wanted well."

MICHAEL SHAPIRO's *most recent book is* The Last Good Season *(2003).*

INTERVIEW

MARIA ZUBER

PLANETARY SCIENTIST, MIT, CAMBRIDGE, MASSACHUSETTS

PAULA LERNER

On the surprise evidence of flowing water on Mars

BY LAURA HELMUTH

THE MARS GLOBAL SURVEYOR JUST WENT DARK AFTER CIRCLING MARS FOR TEN YEARS. WHAT WERE ITS MOST IMPORTANT FINDINGS? We made the first viable model of the internal structure of Mars—including that the core of Mars is probably still fluid. Another experiment found signs of hematite, a mineral sometimes formed in the presence of water. The most recent discovery was evidence for liquid flowing water on the surface. If you look year to year, you see evidence that the surface has changed. New gullies appear, and you see them only in places where the temperature rose above the melting point of water. This caused a big change in our thinking because all the theories said it shouldn't be possible to have liquid water on the surface of Mars because today the atmosphere is so thin. Of course, it has fascinating implications for whether or not life might ever have developed there.

CAN YOU DRINK THE WATER? It probably has salts and other minerals in it. It would be like drinking acid mine water. But you can purify water. Someday, when we send people to Mars, it'll be much easier to send devices that melt ice and purify water than it would be to send water with them.

WHAT ARE THE BIG QUESTIONS ABOUT MARS THAT REMAIN? Where did the water go? And what caused the climate to change so that Mars lost much of its atmosphere 3.8 billion years ago? Today, a quarter of the Martian atmosphere condenses into the polar caps as snow each year, then goes back into the atmosphere. The snow isn't water ice; the atmosphere is carbon dioxide, so Mars snows dry ice.

YOU ADVISED THE BUSH ADMINISTRATION ON WHAT SCIENCE ASTRONAUTS MIGHT DO ON MARS. You'll never be able to justify sending humans to Mars simply for scientific purposes, because you'll always be able to design robotic experiments that provide great science at a lower cost. So the rationale for sending humans is exploration. However, once humans are there, I believe there will be discoveries they can make that robots can't. For example, if life does exist on Mars, it could be deep within the crust, where it's warmer than on the surface. If that's the case, you have to drill deep within the crust, and you're not going to be able to do that with robots.

IF IT WERE POSSIBLE, WOULD YOU GO TO MARS? Can I wait until I get my kids through college? Yeah, I sure would. But a more practical goal for me is to have one of my students go. One of these days, somebody I've taught and trained, I hope, will walk on Mars.

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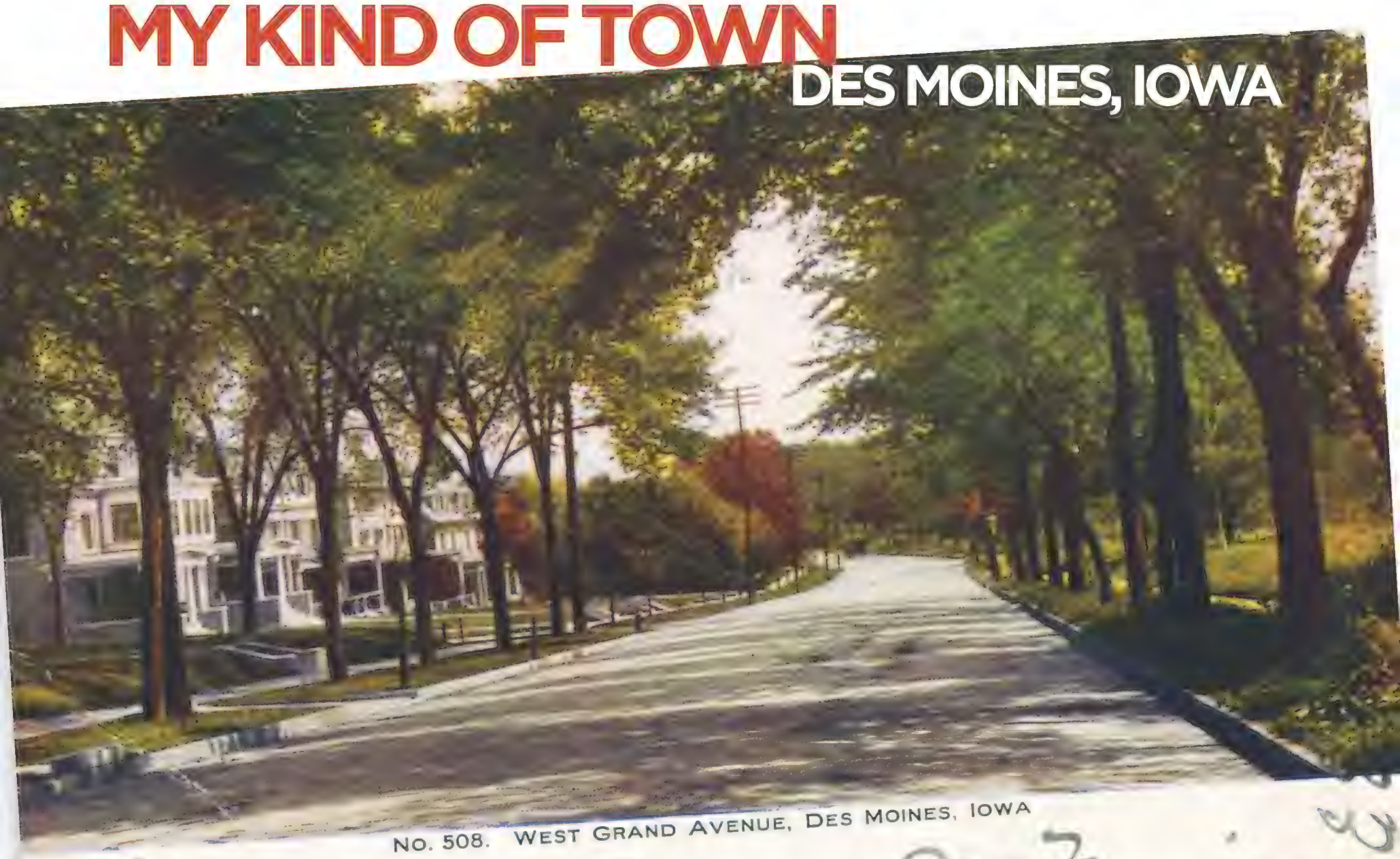
MY KIND OF TOWN

DES MOINES, IOWA



Boys' Life

In 1950s Des Moines, childhood was "unsupervised, unregulated and robustly physical" **BY BILL BRYSON**

THEN, AS NOW, Des Moines was a safe, wholesome city. The streets were long, straight, leafy and clean and had solid middle-American names: Woodland, University, Pleasant, Grand. (There was a local joke, much retold, about a woman who was goosed on Grand and thought it was Pleasant.) It was a nice city—a comfortable city. Most businesses were close to the road and had lawns out front instead of parking lots. Public buildings—post offices, schools, hospitals—were stately and imposing. Gas stations often looked like little cottages. Diners (or roadhouses) brought to mind the type of cabins you might find on a fishing trip. Nothing was designed to be particularly helpful or beneficial to cars. It was a greener, quieter, less intrusive world.

Grand Avenue was the main artery through the city, linking downtown, where everyone worked and did all serious shopping, with the residential areas beyond. The best houses in the city lay to the south of Grand on the west side of town, in a hilly, gorgeously wooded district that ran down to Waterworks Park and the Raccoon River. You could walk for hours along the

"There were kids everywhere, in densities now unimaginable," says Bryson (at age 7).

CURT TEICH POSTCARD ARCHIVES / LAKE COUNTY, IL DISCOVERY MUSEUM; RANDOM HOUSE

Oh, it's not that the Society has a lot of members here. But being thought of as the very end of the Earth goes a long way to explaining the sensation of just being here – feeling at the same time lost and found.

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wandering roads in there and never see anything but perfect lawns, old trees, freshly washed cars and lovely, happy homes. It was miles and miles of the American dream. This was my district—South of Grand.

The most striking difference between then and now was how many kids there were then. America had 32 million children age 12 or under in the mid-1950s, and four million new babies were plopping onto the changing mats every year. So there were kids everywhere, all the time, in densities now unimaginable, but especially whenever anything interesting or unusual happened. Early every summer, at the start of the mosquito season, a city employee in an open jeep would come to the neighborhood and drive madly all over the place—across lawns, through woods, bumping along culverts, jouncing into and out of vacant lots—with a fogging machine that pumped out dense, colorful clouds of insecticide through which at least 11,000 children scampered joyously for most of the day. It was awful stuff—it tasted foul, it made your lungs chalky, it left you with a powdery saffron pallor that no amount of scrubbing could eradicate. For years afterward whenever I coughed into a white handkerchief I brought up a little ring of colored powder.

But nobody ever thought to stop us or suggest that it was perhaps unwise to be scampering through choking clouds of insecticide. Possibly it was thought that a generous dusting of DDT would do us good. It was that kind of age. Or maybe we were just considered expendable because there were so many of us.

The other difference from those days was that kids were always outdoors—I knew kids who were pushed out the door at eight in the morning and not allowed back in until five unless they were on fire or actively bleeding—and they were always looking for something to do. If you stood on any corner with a bike—any corner anywhere—more than a hundred children, many of whom you had never seen before, would appear and ask you where you were going.

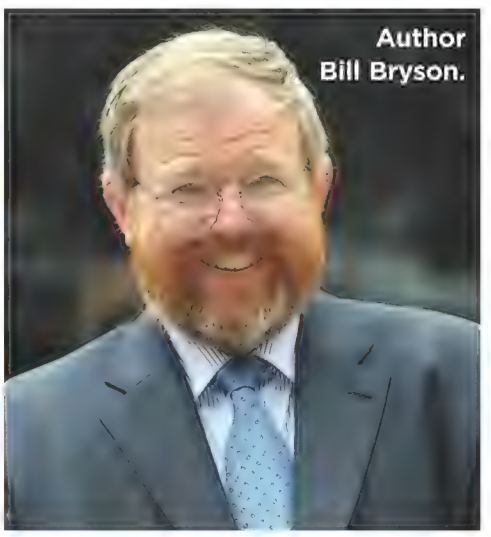
"Might go down to the Trestle," you would say thoughtfully. The Trestle was a railway bridge over the Raccoon River from which you could jump in for a swim if you didn't mind paddling around among dead fish, old tires, oil drums, algal slime, heavy metal effluents and uncategorized goo. It was one of ten recognized landmarks in our district. The others were the Woods, the Park, the Little League Park (or "the Ballpark"), the Pond, the River, the Railroad Tracks (usually just "the Tracks"), the Vacant Lot, Greenwood (our school) and the New House. The New House was any house under construction and so changed regularly.

"Can we come?" they'd say.

"Yeah, all right," you would answer if they were your size or "If you think you can keep up" if they were smaller. And when you got to the Trestle or the Vacant Lot or the Pond there would already be 600 kids there. There were always 600 kids everywhere except where two or more neighborhoods met—at the Park, for instance—where the numbers would grow into the thousands. I once took part in an ice hockey game at the lagoon in Greenwood Park that involved 4,000 kids, all slashing away violently with sticks, and went on for at least three-quarters of an hour before anyone realized that we didn't have a puck.

Life in Kid World, wherever you went, was unsupervised, unregulated and robustly—at times insanely—physical, and yet it was a remarkably peaceable place. Kids' fights never went too far, which is extraordinary when you consider how ill-controlled children's tempers are. Once when I was about 6, I saw a kid throw a rock at another kid, from quite a distance, and it bounced off the target's head (quite beautifully I have to say) and made him bleed. This was talked about for years. People in the next county knew about it. The kid who did it was sent for about 10,000 hours of therapy.

Des Moines today.



Author Bill Bryson.

Lonny Brankovich instantly melted in a faint. In a candid tone, his brother said: "You're gonna die."

With respect to accidental bloodshed, it is my modest boast that I became the neighborhood's most memorable contributor one tranquil September afternoon in my 10th year while playing football in Leo Collingwood's backyard. As always, the game involved about 150 kids, so normally when you were tackled you fell into a soft, marshmallowy mass of bodies. If you were really lucky you landed on Mary O'Leary and got to rest on her for a moment while waiting for the others to get off. She smelled of vanilla—vanilla and fresh grass—and was soft and clean and painfully pretty. It was a lovely moment. But on this occasion I fell outside the pack and hit my head on a stone retaining wall. I remember feeling a sharp pain at the top of my head toward the back.

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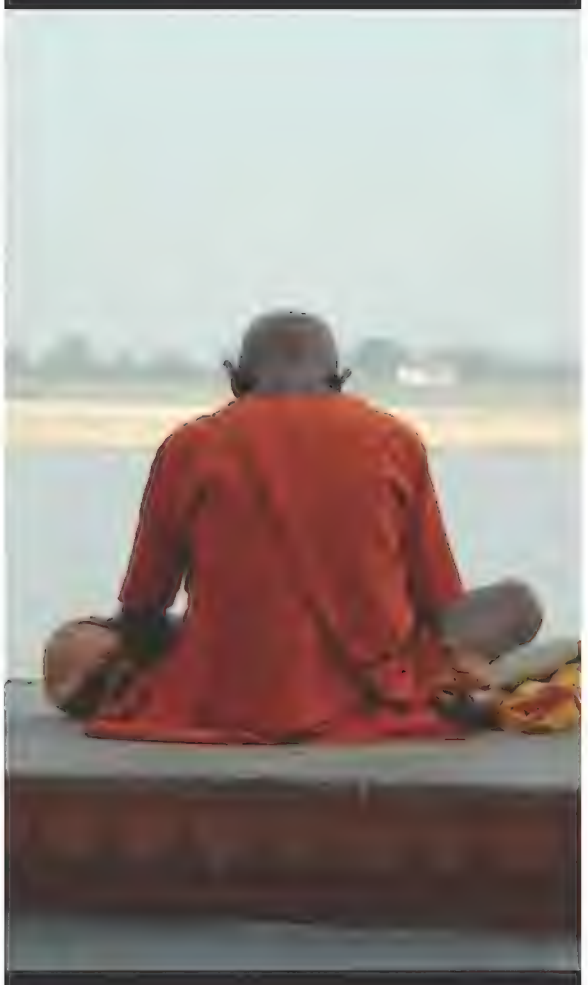

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When I stood up, I saw that everyone was staring at me with a single rapt expression. Lonny Brankovich looked over and instantly melted in a faint. In a candid tone his brother said: "You're gonna die." Naturally, I couldn't see what absorbed them, but I gather from later descriptions that it looked as if I had a lawn sprinkler plugged into the top of my head, spraying blood in all directions in a rather festive manner. I reached up and found a mass of wetness. To the touch, it felt more like the kind of outflow you get when a truck crashes into a fire hydrant or oil is struck in Oklahoma. This felt like a job for Red Adair.

"I think I'd better go get this seen to," I said soberly, and with a 50-foot stride left the yard. I bounded home in three steps and stepped into the kitchen, fountaining lavishly, where I found my father standing by the window with a cup of coffee dreamily admiring Mrs. Bukowski, the young housewife from next door. Mrs. Bukowski had the first bikini in Iowa and wore it while hanging out her wash. My father looked at my spouting head, allowed himself a moment's mindless adjustment, then leapt instantly and adroitly into panic and disorder, moving in as many as six directions at once, and calling in a strained voice to my mother to come at once and bring lots of towels—"old ones!"—because Billy was bleeding to death in the kitchen.

Everything after that went by in a blur. I remember being seated with my head pressed to the kitchen table by my father as he endeavored to staunch the flow of blood and at the same time get through on the phone to Dr. Alzheimer, the family physician. Meanwhile, my mother, ever imperturbable, searched methodically for old rags and pieces of cloth that could be safely sacrificed (or were red already) and dealt with the parade of children who were turning up at the backdoor with bone chips and bits of gray tissue that they had carefully lifted from the rock and thought might be part of my brain.

I couldn't see much, of course, with my head pressed to the table, but I did catch reflected glimpses in the toaster and my father seemed to be into my cranial cavity up to his elbows. At the same time he was speaking to Dr. Alzheimer in words that failed to soothe. "Jesus Christ, Doc," he was saying. "You wouldn't *believe* the amount of blood. We're *swimming* in it."

On the other end I could hear Dr. Alzheimer's dementedly laid-back voice. "Well, I *could* come over, I suppose," he was saying. "It's just that I'm watching an *awfully* good golf tournament. Ben Hogan is having a most marvelous round. Isn't it wonderful to see him doing well at his time of life? Now then, have you managed to stop the bleeding?"

"Well, I'm sure trying."

"Good, good. That's excellent—that's *ex*cellent. Because he's probably lost *quite* a lot of blood already. Tell me, is the little fellow still breathing?"

"I think so," my father replied.

I nodded helpfully.

"Yes, he's still breathing, Doc."

"That's good, that's very good. OK, I tell you what. Give him two aspirin and nudge him once in a while to make sure he doesn't pass out—on no account let him lose consciousness, because you might lose the poor little fellow—and I'll be over after the tournament. Oh, look at that—he's gone straight off the green into the rough." There was the sound of Dr. Alzheimer's phone settling back into the cradle and the buzz of disconnection.

Happily, I didn't die, and four hours later was to be found sitting up in bed, head extravagantly turbaned, well rested after a nap that came during one of those passing three-hour moments when my parents forgot to check on my wakefulness, eating tubs of chocolate ice cream, and regally receiving visitors from the neighborhood, giving particular priority to those who came bearing gifts. Dr. Alzheimer arrived later than promised, smelling lightly of bourbon. He spent most of the visit sitting on the edge of my bed and asking me if I was old enough to remember Bobby Jones. He never did look at my head.

BILL BRYSON *lives in England with his wife and children.*

Sea Island Strata

At a former Georgia plantation, archaeologists delve into both the workaday and spiritual lives of slaves

BY ERIC WILLS

ON THE NORTHERN END of Ossabaw Island, three former slave cabins sit in a perfect row—remains of a plantation that predates the Revolutionary War. Dan Elliott stands next to the cabins one morning, near palm trees silhouetted against the gray sky. For five weeks he has been digging inside the cabins. Now he has set his shovel aside.

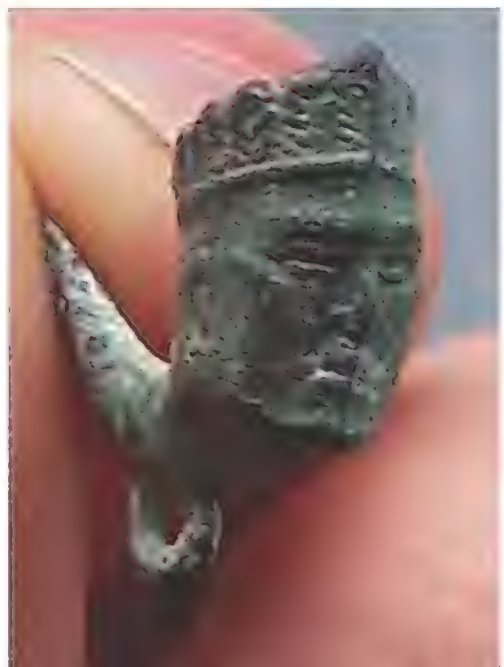
Wearing a blue-striped train conductor's cap and dirt-stained jeans, he holds the handle of a ground-penetrating radar device that looks like a lawn mower. At its base is a small black box that emits radar, and attached to the handle is a laptop computer. Elliott is an archaeologist and the president of a nonprofit archaeology firm called the Lamar Institute, based in Savannah. On his computer screen is a map of Ossabaw from the year 1860. It shows six additional slave cabins in the same row as the three still standing today. He hopes the radar will detect the buried foundations of the vanished buildings.

As he pushes the device across the grass, a readout like that of a seismograph during an earthquake appears on the computer screen. Elliott, a soft-spoken Georgia native, breaks into a broad grin. "The ground is crawling with objects," he says.

The artifacts that Elliott has unearthed may give new insight into how the people who lived here as long ago as the 1700s endured slavery and retained their African traditions. Ossabaw may be "the gold standard for understanding slave life on the barrier islands," Elliott says.

Somewhat surprisingly, he's the first archaeologist to break ground on the 250-year-old plantation. For much of the 20th century, Ossabaw—about 15 miles south of Savannah—was the home of Eleanor Torrey West, of Grosse Point, Michigan. She inherited the island from her parents, who'd bought it in 1924 as a winter retreat. A series of previous owners, mostly wealthy businessmen, had used Ossabaw to hunt hogs and deer and had kept the cabins intact. In 1978, West gave the island to Georgia, with the stipulation that it become the state's first heritage preserve and be protected from development.

Ossabaw's first plantation was owned by John Morel, a Savannah



One slave-era artifact unearthed on Ossabaw Island (cabins, above) is a pewter pipe charm (left), its visage a possible allusion to oppression.

STEPHEN MORTON / GETTY IMAGES; ERIC WILLS

merchant, who acquired the island in 1763, not long after a contemporary gave it a lukewarm assessment, writing that it was "very much broken with Creeks and Marshes" and had "no large Quantity of good planting Land in any one Place." But Morel, who owned rice and cotton plantations on the mainland, found fertile soil. He planted indigo, a crop much in demand for making blue dye. When Morel died in 1776, the island's 26,000 acres were divided into four sections: North End, Middle Place, South End and Buckhead, and bequeathed to his sons. After the Revolutionary War, the Morel sons planted a new crop, Sea Island cotton, which had stronger and silkier filaments than cotton grown on the mainland.

The North End plantation—the site of Elliott's dig—prospered and expanded from about 30 slaves before the American Revolution to around 70 prior to the Civil War. No written records of slave life survive from the North End, but journals from the South End document slaves with names such as Cyrus, July and Young Betsey. They plowed and fertilized the plantation, picked cotton, built fences and butchered hogs.

They also made a cement-like mixture called tabby that was used to construct the three standing slave cabins on the North End. Tabby, made with lime, oyster shells, sand and water, was popular in the coastal Southeast, where building stones and brick-making soil were scarce. The cabins measure 32 feet by 16 feet, a common size for slave quarters in the South. A chimney runs up the middle of each cabin and divides it into two rooms. Each room probably housed at least four people. The cabins would have been "crowded, with little privacy, and smoky during cold weather" when a fire was burning, says William Dusinberre, a historian at the University of Warwick in England.

George Fore, an architectural conservator and consultant to the Ossabaw Island Foundation, estimated that two of the cabins were built about two decades before the Civil War. He discovered a pattern of marks on some beams that suggests a steam-engine-powered mill produced the lumber. Elliott dated the third cabin to the 1820s after finding at the base of its chimney a half-cent coin from 1825.

Many of the artifacts may reflect the slaves' spiritual beliefs. Elliott has unearthed alligator teeth and raccoon bones, items often part of a mojo bag, a collection of objects the slaves used for supernatural purposes, he says. He also found 16 glass beads, many of them blue. "We don't know how the slaves wore them," Elliott says, but they may have been used to ward off evil spirits. According to African-American folklore along Georgia's barrier islands, ghosts are afraid of blue because it reminds them of heaven.

The most intriguing find so far is a pewter tobacco-pipe charm about an inch long. A carving of a face topped by a crown appears on the front. Elliott's interpretation of it is based in part on a similar pipe excavated from a pre-Civil War settlement of free African-Americans in Augusta, Georgia. He speculates that the king's image may be modeled on a statue excavated in the 1840s at Nineveh, the ancient capital of the Assyrian empire, in present-day Iraq. In the Old Testament, the prophet Nahum foresees the destruction of the people of Nineveh because of their wicked ways. For the slaves, the Nineveh-inspired pipe charm may have been a symbol of the Southern plantation system and their hope for its eventual destruction, says Elliott.

Blue glass beads (left) found on the property (Dan Elliott and a co-worker in a cabin) may have been worn by slaves to ward off evil spirits.

Most of Elliott's artifacts come from the 19th century, but the deeper he dug, the farther back in time he went. He uncovered 18th-century objects such as brass buttons and shards of English slipware, a coarse pottery with combed decorations that is rarely found after the Colonial era. Inside the middle cabin he discovered 44 tobacco pipe stems that date on average to about 1769; other archaeologists have documented that holes in pipe stems grew smaller over the years as the technology to make them improved. The pipes and other artifacts led Elliott to conclude that an earlier slave dwelling once sat where the middle cabin was built.

Using ground-penetrating radar, Elliott has found promising places to dig in the future, including the possible remains of a Colonial-era, circular-shaped dwelling and what looks to be another buried cabin. Artifacts from Ossabaw give us "a personal window into what slaves' lives were like," says David Crass, Georgia's state archaeologist—lives that otherwise were recorded merely as property.

ERIC WILLS *lives in Washington, D.C. and specializes in writing about history and architecture.*

STEPHEN MORTON / GETTY IMAGES; DANIEL ELLIOTT

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THIS MONTH IN HISTORY

FEBRUARY ANNIVERSARIES
MOMENTOUS OR MERELY MEMORABLE

BY ALISON McLEAN

140 YEARS AGO
LITTLE HOUSE LAURA

Laura Ingalls is born on February 7, 1867, near Pepin, Wisconsin. Her stories of the pioneer West of her childhood and marriage to Almanzo Wilder—beginning, in 1932, with *Little House in the Big Woods*—bring Pa, Ma and the girls to readers of more than 40 languages, inspire a TV series and draw sunbonneted fans to seven "Laura homesite" museums. She dies in 1957, at age 90.

70 YEARS AGO
SEXY SCIENCE

As U.S. relations with Japan grow touchy—making silk scarce—DuPont chemist Wallace Hume Carothers patents a "pliable, strong and elastic" substitute on February 16, 1937. With subsequent tinkering, his "linear condensation superpolymers" had become nylon, the first commercial synthetic fiber. Although it starts out in toothbrushes, nylon becomes synonymous with stockings after synthetic hose hits the market in 1940. Carothers commits suicide in 1937, at age 41.

420 YEARS AGO
FAMILY MATTERS

After 19 years under house arrest, Mary Stuart, Queen of Scots, a Catholic accused of plotting to overthrow the Protestant monarchy of her cousin, England's Elizabeth I, is beheaded at Fotheringhay Castle, February 8, 1587. Calling for her maids to "rejoice, and not weep" at the end of her woes, Mary dies, age 44, never having met Elizabeth.

British scientists announce the birth of Dolly, the first mammal cloned from an adult cell, February 22, 1997. Although she's a Finn Dorset sheep, Dolly triggers vigorous debate about the ethics of human cloning. Scientists will go on to clone cattle, goats and mice among other species, while Dolly, arthritic at a young age—perhaps due to her origins—is put down in 2003.

60 YEARS AGO MAKE IT SNAPPY

Edwin Land, 37, shows his face—and the camera that caught it—at an Optical Society meeting in New York on February 21, 1947. His Polaroid Land camera makes its own prints using paper that contains developer and fixer. On sale in 1948 for $89.75, the cameras are an instant success. Land dies in 1991, at age 81.

75 YEARS AGO
ATOMIC BOMBSHELL

English physicist James Chadwick announces his discovery of a basic atomic building block in the journal *Nature* on February 17, 1932. Theorized since 1920, neutrons, as the new particles are dubbed for their lack of electric charge, have a mass roughly the same as protons, and are found, along with protons and electrons, in every atom except hydrogen. Chadwick wins the Nobel Prize for the discovery in 1935, and dies in 1974, at age 82.

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CRESTOR can get your bad cholesterol down. It can also get your good cholesterol up.

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raise good cholesterol (HDL) by up to **14%** (vs 3% with placebo)

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CRESTOR® (rosuvastatin calcium) is prescribed along with diet for lowering high cholesterol and has not been determined to prevent heart disease, heart attacks, or strokes. CRESTOR is not right for everyone, including women who are nursing, pregnant, or who may become pregnant, or anyone with liver problems. Your doctor will do blood tests before and during treatment with CRESTOR to monitor your liver function. Unexplained muscle pain and weakness could be a sign of a rare but serious side effect and should be reported to your doctor right away. The 40-mg dose of CRESTOR is only for patients who do not reach goal on 20 mg. Be sure to tell your doctor if you are taking any medications. Side effects occur infrequently and include muscle aches, constipation, weakness, abdominal pain, and nausea. They are usually mild and tend to go away.

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BRIEF SUMMARY: For full Prescribing Information, see package insert. **INDICATIONS AND USAGE** CRESTOR is indicated: 1. as an adjunct to diet to reduce elevated total-C, LDL-C, ApoB, nonHDL-C, and TG levels and to increase HDL-C in patients with primary hypercholesterolemia (heterozygous familial and nonfamilial) and mixed dyslipidemia (Fredrickson Type IIa and IIb); 2. as an adjunct to diet for the treatment of patients with elevated serum TG levels (Fredrickson Type IV); 3. to reduce LDL-C, total-C, and ApoB in patients with homozygous familial hypercholesterolemia as an adjunct to other lipid-lowering treatments (e.g., LDL apheresis) or if such treatments are unavailable. **CONTRAINDICATIONS** CRESTOR is contraindicated in patients with a known hypersensitivity to any component of this product. Rosuvastatin is contraindicated in patients with active liver disease or with unexplained persistent elevations of serum transaminases (see WARNINGS, Liver Enzymes). **Pregnancy and Lactation** Atherosclerosis is a chronic process and discontinuation of lipid-lowering drugs during pregnancy should have little impact on the outcome of long-term therapy of primary hypercholesterolemia. Cholesterol and other products of cholesterol biosynthesis are essential components for fetal development (including synthesis of steroids and cell membranes). Since HMG-CoA reductase inhibitors decrease cholesterol synthesis and possibly the synthesis of other biologically active substances derived from cholesterol, they may cause fetal harm when administered to pregnant women. Therefore, HMG-CoA reductase inhibitors are contraindicated during pregnancy and in nursing mothers. ROSUVASTATIN SHOULD BE ADMINISTERED TO WOMEN OF CHILDBEARING AGE ONLY WHEN SUCH PATIENTS ARE HIGHLY UNLIKELY TO CONCEIVE AND HAVE BEEN INFORMED OF THE POTENTIAL HAZARDS. If the patient becomes pregnant while taking this drug, therapy should be discontinued immediately and the patient apprised of the potential hazard to the fetus. **WARNINGS Liver Enzymes** HMG-CoA reductase inhibitors, like some other lipid-lowering therapies, have been associated with biochemical abnormalities of liver function. The incidence of persistent elevations (>3 times the upper limit of normal [ULN] occurring on 2 or more consecutive occasions) in serum transaminases in fixed dose studies was 0.4, 0, 0, and 0.1% in patients who received rosuvastatin 5, 10, 20, and 40 mg, respectively. In most cases, the elevations were transient and resolved or improved on continued therapy or after a brief interruption in therapy. There were two cases of jaundice, for which a relationship to rosuvastatin therapy could not be determined, which resolved after discontinuation of therapy. There were no cases of liver failure or irreversible liver disease in these trials. **It is recommended that liver function tests be performed before and at 12 weeks following both the initiation of therapy and any elevation of dose, and periodically (e.g., semiannually) thereafter.** Liver enzyme changes generally occur in the first 3 months of treatment with rosuvastatin. Patients who develop increased transaminase levels should be monitored until the abnormalities have resolved. Should an increase in ALT or AST of >3 times ULN persist, reduction of dose or withdrawal of rosuvastatin is recommended. Rosuvastatin should be used with caution in patients who consume substantial quantities of alcohol and/or have a history of liver disease (see CLINICAL PHARMACOLOGY, Special Populations, Hepatic Insufficiency). Active liver disease or unexplained persistent transaminase elevations are contraindications to the use of rosuvastatin (see CONTRAINDICATIONS). **Myopathy/Rhabdomyolysis Rare cases of rhabdomyolysis with acute renal failure secondary to myoglobinuria have been reported with rosuvastatin and with other drugs in this class.** Uncomplicated myalgia has been reported in rosuvastatin-treated patients (see ADVERSE REACTIONS). Creatine kinase (CK) elevations (>10 times upper limit of normal) occurred in 0.2% to 0.4% of patients taking rosuvastatin at doses up to 40 mg in clinical studies. Treatment-related myopathy, defined as muscle aches or muscle weakness in conjunction with increases in CK values >10 times upper limit of normal, was reported in up to 0.1% of patients taking rosuvastatin doses of up to 40 mg in clinical studies. In clinical trials, the incidence of myopathy and rhabdomyolysis increased at doses of rosuvastatin above the recommended dosage range (5 to 40 mg). In postmarketing experience, effects on skeletal muscle, e.g. uncomplicated myalgia, myopathy and, rarely, rhabdomyolysis have been reported in patients treated with HMG-CoA reductase inhibitors including rosuvastatin. As with other HMG-CoA reductase inhibitors, reports of rhabdomyolysis with rosuvastatin are rare, but higher at the highest marketed dose (40 mg). Factors that may predispose patients to myopathy with HMG-CoA reductase inhibitors include advanced age (≥65 years), hypothyroidism, and renal insufficiency. Consequently: 1. Rosuvastatin should be prescribed with caution in patients with predisposing factors for myopathy, such as, renal impairment (see DOSAGE AND ADMINISTRATION), advanced age, and inadequately treated hypothyroidism. 2. Patients should be advised to promptly report unexplained muscle pain, tenderness, or weakness, particularly if accompanied by malaise or fever. Rosuvastatin therapy should be discontinued if markedly elevated CK levels occur or myopathy is diagnosed or suspected. 3. The 40 mg dose of rosuvastatin is reserved only for those patients who have not achieved their LDL-C goal utilizing the 20 mg dose of rosuvastatin once daily (see DOSAGE AND ADMINISTRATION). 4. The risk of myopathy during treatment with rosuvastatin may be increased with concurrent administration of other lipid-lowering therapies or cyclosporine, (see CLINICAL PHARMACOLOGY, Drug Interactions, PRECAUTIONS, Drug Interactions, and DOSAGE AND ADMINISTRATION). **The benefit of further alterations in lipid levels by the combined use of rosuvastatin with fibrates or niacin should be carefully weighed against the potential risks of this combination. Combination therapy with rosuvastatin and gemfibrozil should generally be avoided. (See DOSAGE AND ADMINISTRATION and PRECAUTIONS, Drug Interactions).** 5. **The risk of myopathy during treatment with rosuvastatin may be increased in circumstances which increase rosuvastatin drug levels (see CLINICAL PHARMACOLOGY, Special Populations, Race and Renal Insufficiency, and PRECAUTIONS, General).** 6. **Rosuvastatin therapy should also be temporarily withheld in any patient with an acute, serious condition suggestive of myopathy or predisposing to the development of renal failure secondary to rhabdomyolysis (e.g., sepsis, hypotension, dehydration, major surgery, trauma, severe metabolic, endocrine, and electrolyte disorders, or uncontrolled seizures).** **PRECAUTIONS General** Before instituting therapy with rosuvastatin, an attempt should be made to control hypercholesterolemia with appropriate diet and exercise, weight reduction in obese patients, and treatment of underlying medical problems (see INDICATIONS AND USAGE). Administration of rosuvastatin 20 mg to patients with severe renal impairment (CL_{cr} <30 mL/min/1.73 m^2) resulted in a 3-fold increase in plasma concentrations of rosuvastatin compared with healthy volunteers (see WARNINGS, Myopathy/Rhabdomyolysis and DOSAGE AND ADMINISTRATION). The result of a large pharmacokinetic study conducted in the US demonstrated an approximate 2-fold elevation in median exposure in Asian subjects (having either Filipino, Chinese, Japanese, Korean, Vietnamese or Asian-Indian origin) compared with a Caucasian control group. This increase should be considered when making rosuvastatin dosing decisions for Asian patients. (See WARNINGS, Myopathy/Rhabdomyolysis; CLINICAL PHARMACOLOGY, Special Populations, Race, and DOSAGE AND ADMINISTRATION.) **Information for Patients** Patients should be advised to report promptly unexplained muscle pain, tenderness, or weakness, particularly if accompanied by malaise or fever. When taking rosuvastatin with an aluminum and magnesium hydroxide combination antacid, the antacid should be taken at least 2 hours after rosuvastatin administration (see CLINICAL PHARMACOLOGY, Drug Interactions). **Laboratory Tests** In the rosuvastatin clinical trial program, dipstick-positive proteinuria and microscopic hematuria were observed among rosuvastatin-treated patients, predominantly in patients dosed above the recommended dose range (i.e., 80 mg). However, this finding was more frequent in patients taking rosuvastatin 40 mg, when compared to lower doses of rosuvastatin or comparator statins, though it was generally transient and was not associated with worsening renal function. Although the clinical significance of this finding is unknown, a dose reduction should be considered for patients on rosuvastatin 40 mg therapy with unexplained persistent proteinuria during routine urinalysis testing. **Drug Interactions Cyclosporine:** When rosuvastatin 10 mg was coadministered with cyclosporine in cardiac transplant patients, rosuvastatin mean C_{max} and mean AUC were increased 11-fold and 7-fold, respectively, compared with healthy volunteers. These increases are considered to be clinically significant and require special consideration in the dosing of rosuvastatin to patients taking concomitant cyclosporine (see WARNINGS, Myopathy/Rhabdomyolysis, and DOSAGE AND ADMINISTRATION). **Warfarin:** Coadministration of rosuvastatin to patients on stable warfarin therapy resulted in clinically significant rises in INR (>4, baseline 2-3). In patients taking coumarin anticoagulants and rosuvastatin concomitantly, INR should be determined before starting rosuvastatin and frequently enough during early therapy to ensure that no significant alteration of INR occurs. Once a stable INR time has been documented, INR can be monitored at the intervals usually recommended for patients on coumarin anticoagulants. If the dose of rosuvastatin is changed, the same procedure should be repeated. Rosuvastatin therapy has not been associated with bleeding or with changes in INR in patients not taking anticoagulants. **Gemfibrozil:** Coadministration of a single rosuvastatin dose to healthy volunteers on gemfibrozil (600 mg twice daily) resulted in a 2.2- and 1.9-fold, respectively, increase in mean C_{max} and mean AUC of rosuvastatin (see DOSAGE AND ADMINISTRATION). **Endocrine Function** Although clinical studies have shown that rosuvastatin alone does not reduce basal plasma cortisol concentration or impair adrenal reserve, caution should be exercised if any HMG-CoA reductase inhibitor or other agent used to lower cholesterol levels is administered concomitantly with drugs that may decrease the levels or activity of endogenous steroid hormones such as ketoconazole, spironolactone, and cimetidine. **CNS Toxicity** CNS vascular lesions, characterized by perivascular hemorrhages, edema, and mononuclear cell infiltration of perivascular spaces, have been observed in dogs treated with several other members of this drug class. A chemically similar drug in this class produced dose-dependent optic nerve degeneration (Wallerian degeneration of retinogeniculate fibers) in dogs, at a dose that produced plasma drug levels about 30 times higher than the mean drug level in humans taking the highest recommended dose. Edema, hemorrhage, and partial necrosis in the interstitium of the choroid plexus was observed in a female dog sacrificed moribund at day 24 at 90 mg/kg/day by oral gavage (systemic exposures 100 times the human exposure at 40 mg/day based on AUC comparisons). Corneal opacity was seen in dogs treated for 52 weeks at 6 mg/kg/day by oral gavage (systemic exposures 20 times the human exposure at 40 mg/day based on AUC comparisons). Cataracts were seen in dogs treated for 12 weeks by oral gavage at 30 mg/kg/day (systemic exposures 60 times the human exposure at 40 mg/day based on AUC comparisons). Retinal dysplasia and retinal loss were seen in dogs treated for 4 weeks by oral gavage at 90 mg/kg/day (systemic exposures 100 times the human exposure at 40 mg/day based on AUC). Doses ≤30 mg/kg/day (systemic exposures ≤60 times the human exposure at 40 mg/day based on AUC comparisons) following treatment up to one year, did not reveal retinal findings. **Carcinogenesis, Mutagenesis, Impairment of Fertility** In a 104-week carcinogenicity study in rats at dose levels of 2, 20, 60, or 80 mg/kg/day by oral gavage, the incidence of uterine stromal polyps was significantly increased in females at

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80 mg/kg/day at systemic exposure 20 times the human exposure at 40 mg/day based on AUC. Increased incidence of polyps was not seen at lower doses. In a 107-week carcinogenicity study in mice given 10, 60, 200 mg/kg/day by oral gavage, an increased incidence of hepatocellular adenoma/carcinoma was observed at 200 mg/kg/day at systemic exposures 20 times human exposure at 40 mg/day based on AUC. An increased incidence of hepatocellular tumors was not seen at lower doses. Rosuvastatin was not mutagenic or clastogenic with or without metabolic activation in the Ames test with *Salmonella typhimurium* and *Escherichia coli*, the mouse lymphoma assay, and the chromosomal aberration assay in Chinese hamster lung cells. Rosuvastatin was negative in the *in vivo* mouse micronucleus test. In rat fertility studies with oral gavage doses of 5, 15, 50 mg/kg/day, males were treated for 9 weeks prior to and throughout mating and females were treated 2 weeks prior to mating and throughout mating until gestation day 7. No adverse effect on fertility was observed at 50 mg/kg/day (systemic exposures up to 10 times human exposure at 40 mg/day based on AUC comparisons). In testicles of dogs treated with rosuvastatin at 30 mg/kg/day for one month, spermatidic giant cells were seen. Spermatidic giant cells were observed in monkeys after 6-month treatment at 30 mg/kg/day in addition to vacuolation of seminiferous tubular epithelium. Exposures in the dog were 20 times and in the monkey 10 times human exposure at 40 mg/day based on body surface area comparisons. Similar findings have been seen with other drugs in this class. **Pregnancy *Pregnancy Category X*** See CONTRAINDICATIONS. Rosuvastatin may cause fetal harm when administered to a pregnant woman. Rosuvastatin is contraindicated in women who are or may become pregnant. Safety in pregnant women has not been established. There are no adequate and well-controlled studies of rosuvastatin in pregnant women. Rosuvastatin crosses the placenta and is found in fetal tissue and amniotic fluid at 3% and 20%, respectively, of the maternal plasma concentration following a single 25 mg/kg oral gavage dose on gestation day 16 in rats. A higher fetal tissue distribution (25% maternal plasma concentration) was observed in rabbits after a single oral gavage dose of 1 mg/kg on gestation day 18. If this drug is administered to a woman with reproductive potential, the patient should be apprised of the potential hazard to a fetus. In female rats given oral gavage doses of 5, 15, 50 mg/kg/day rosuvastatin before mating and continuing through day 7 postcoitus results in decreased fetal body weight (female pups) and delayed ossification at the high dose (systemic exposures 10 times human exposure at 40 mg/day based on AUC comparisons). In pregnant rats given oral gavage doses of 2, 20, 50 mg/kg/day from gestation day 7 through lactation day 21 (weaning), decreased pup survival occurred in groups given 50 mg/kg/day, systemic exposures ≥12 times human exposure at 40 mg/day based on body surface area comparisons. In pregnant rabbits given oral gavage doses of 0.3, 1, 3 mg/kg/day from gestation day 6 to lactation day 18 (weaning), exposures equivalent to human exposure at 40 mg/day based on body surface area comparisons, decreased fetal viability and maternal mortality was observed. Rosuvastatin was not teratogenic in rats at ≤25 mg/kg/day or in rabbits ≤3 mg/kg/day (systemic exposures equivalent to human exposure at 40 mg/day based on AUC or body surface comparison, respectively). **Nursing Mothers** It is not known whether rosuvastatin is excreted in human milk. Studies in lactating rats have demonstrated that rosuvastatin is secreted into breast milk at levels 3 times higher than that obtained in the plasma following oral gavage dosing. Because many drugs are excreted in human milk and because of the potential for serious adverse reactions in nursing infants from rosuvastatin, a decision should be made whether to discontinue nursing or administration of rosuvastatin taking into account the importance of the drug to the lactating woman. **Pediatric Use** The safety and effectiveness in pediatric patients have not been established. Treatment experience with rosuvastatin in a pediatric population is limited to 8 patients with homozygous FH. None of these patients was below 8 years of age. **Geriatric Use** Of the 10,275 patients in clinical studies with rosuvastatin, 3,159 (31%) were 65 years and older, and 698 (6.8%) were 75 years and older. The overall frequency of adverse events and types of adverse events were similar in patients above and below 65 years of age. (See WARNINGS, Myopathy/Rhabdomyolysis.) The efficacy of rosuvastatin in the geriatric population (≥65 years of age) was comparable to the efficacy observed in the non-elderly. **ADVERSE REACTIONS** Rosuvastatin is generally well tolerated. Adverse reactions have usually been mild and transient. In clinical studies of 10,275 patients, 3.7% were discontinued due to adverse experiences attributable to rosuvastatin. The most frequent adverse events thought to be related to rosuvastatin were myalgia, constipation, asthenia, abdominal pain, and nausea. **Clinical Adverse Experiences** Adverse experiences, regardless of causality assessment, reported in ≥2% of patients in placebo-controlled clinical studies of rosuvastatin are shown in Table 1; discontinuations due to adverse events in these studies of up to 12 weeks duration occurred in 3% of patients on rosuvastatin and 5% on placebo.

Table 1. Adverse Events in Placebo-Controlled Studies

Adverse event	Rosuvastatin N=744	Placebo N=382
Pharyngitis	9.0	7.6
Headache	5.5	5.0
Diarrhea	3.4	2.9
Dyspepsia	3.4	3.1
Nausea	3.4	3.1
Myalgia	2.8	1.3
Asthenia	2.7	2.6
Back pain	2.6	2.4
Flu syndrome	2.3	1.8
Urinary tract infection	2.3	1.6
Rhinitis	2.2	2.1
Sinusitis	2.0	1.8

In addition, the following adverse events were reported, regardless of causality assessment, in ≥1% of 10,275 patients treated with rosuvastatin in clinical studies. The events in *italics* occurred in ≥2% of these patients. **Body as a Whole:** *Abdominal pain, accidental injury, chest pain, infection, pain,* pelvic pain, and neck pain. **Cardiovascular System:** *Hypertension,* angina pectoris, vasodilatation, and palpitation. **Digestive System:** *Constipation, gastroenteritis,* vomiting, flatulence, periodontal abscess, and gastritis. **Endocrine:** Diabetes mellitus. **Hemic and Lymphatic System:** Anemia and ecchymosis. **Metabolic and Nutritional Disorders:** *Peripheral edema.* **Musculoskeletal System:** *Arthritis, arthralgia,* and pathological fracture. **Nervous System:** *Dizziness, insomnia, hypertonia, paresthesia, depression,* anxiety, vertigo, and neuralgia. **Respiratory System:** *Bronchitis, cough increased,* dyspnea, pneumonia, and asthma. **Skin and Appendages:** *Rash* and pruritus. **Laboratory Abnormalities:** In the rosuvastatin clinical trial program, dipstick-positive proteinuria and microscopic hematuria were observed among rosuvastatin-treated patients, predominantly in patients dosed above the recommended dose range (i.e., 80 mg). However, this finding was more frequent in patients taking rosuvastatin 40 mg, when compared to lower doses of rosuvastatin or comparator statins, though it was generally transient and was not associated with worsening renal function. (See PRECAUTIONS, Laboratory Tests.) Other abnormal laboratory values reported were elevated creatinine phosphokinase, transaminases, hyperglycemia, glutamyl transpeptidase, alkaline phosphatase, bilirubin, and thyroid function abnormalities. Other adverse events reported less frequently than 1% in the rosuvastatin clinical study program, regardless of causality assessment, included arrhythmia, hepatitis, hypersensitivity reactions (i.e., face edema, thrombocytopenia, leukopenia, vesiculobullous rash, urticaria, and angioedema), kidney failure, syncope, myasthenia, myositis, pancreatitis, photosensitivity reaction, myopathy, and rhabdomyolysis. **Postmarketing Experience** In addition to the events reported above, as with other drugs in this class, the following event has been reported during post-marketing experience with CRESTOR, regardless of causality assessment: very rare cases of jaundice. **OVERDOSAGE** There is no specific treatment in the event of overdose. In the event of overdose, the patient should be treated symptomatically and supportive measures instituted as required. Hemodialysis does not significantly enhance clearance of rosuvastatin. **DOSAGE AND ADMINISTRATION** The patient should be placed on a standard cholesterol-lowering diet before receiving CRESTOR and should continue on this diet during treatment. CRESTOR can be administered as a single dose at any time of day, with or without food. **Hypercholesterolemia (Heterozygous Familial and Nonfamilial) and Mixed Dyslipidemia (Fredrickson Type IIa and IIb)** The dose range for CRESTOR is 5 to 40 mg once daily. Therapy with CRESTOR should be individualized according to goal of therapy and response. The usual recommended starting dose of CRESTOR is 10 mg once daily. However, initiation of therapy with 5 mg once daily should be considered for patients requiring less aggressive LDL-C reductions, who have predisposing factors for myopathy, and as noted below for special populations such as patients taking cyclosporine, Asian patients, and patients with severe renal insufficiency (see CLINICAL PHARMACOLOGY, Race, and Renal Insufficiency, and Drug Interactions. For patients with marked hypercholesterolemia (LDL-C >190 mg/dL) and aggressive lipid targets, a 20-mg starting dose may be considered. After initiation and/or upon titration of CRESTOR, lipid levels should be analyzed within 2 to 4 weeks and dosage adjusted accordingly. **The 40-mg dose of CRESTOR is reserved only for those patients who have not achieved their LDL-C goal utilizing the 20 mg dose of CRESTOR once daily (see WARNINGS, Myopathy/Rhabdomyolysis). When initiating statin therapy or switching from another statin therapy, the appropriate CRESTOR starting dose should first be utilized, and only then titrated according to the patient's individualized goal of therapy.** **Homozygous Familial Hypercholesterolemia** The recommended starting dose of CRESTOR is 20 mg once daily in patients with homozygous FH. The maximum recommended daily dose is 40 mg. CRESTOR should be used in these patients as an adjunct to other lipid-lowering treatments (e.g., LDL apheresis) or if such treatments are unavailable. Response to therapy should be estimated from pre-apheresis LDL-C levels. **Dosage in Asian Patients** Initiation of CRESTOR therapy with 5 mg once daily should be considered for Asian patients. The potential for increased systemic exposures relative to Caucasians is relevant when considering escalation of dose in cases where hypercholesterolemia is not adequately controlled at doses of 5, 10, or 20 mg once daily. (See WARNINGS, Myopathy/Rhabdomyolysis, CLINICAL PHARMACOLOGY, Special Populations, Race, and PRECAUTIONS, General). **Dosage in Patients Taking Cyclosporine** In patients taking cyclosporine, therapy should be limited to CRESTOR 5 mg once daily (see WARNINGS, Myopathy/Rhabdomyolysis, and PRECAUTIONS, Drug Interactions). **Concomitant Lipid-Lowering Therapy** The effect of CRESTOR on LDL-C and total-C may be enhanced when used in combination with a bile acid binding resin. If CRESTOR is used in combination with gemfibrozil, the dose of CRESTOR should be limited to 10 mg once daily (see WARNINGS, Myopathy/Rhabdomyolysis, and PRECAUTIONS, Drug Interactions). **Dosage in Patients With Renal Insufficiency** No modification of dosage is necessary for patients with mild to moderate renal insufficiency. For patients with severe renal impairment (CL_{cr} <30 mL/min/1.73 m^2) not on hemodialysis, dosing of CRESTOR should be started at 5 mg once daily and not to exceed 10 mg once daily (see PRECAUTIONS, General, and CLINICAL PHARMACOLOGY, Special Populations, Renal Insufficiency).

NOTE: This summary provides important information about CRESTOR. For more information, please ask your doctor or health care professional about the full Prescribing Information and discuss it with them.

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Around the Mall

SCENES AND SIGHTINGS FROM THE SMITHSONIAN MUSEUMS AND BEYOND

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CACHE VALUE

Early one morning this past February, Christine Mullen Kreamer, a curator at the National Museum of African Art (NMAfA), got an excited call from shipping and receiving. The first boxes from the Walt Disney Company's donation of 525 African artworks—the largest gift in the museum's history—had arrived. Kreamer dashed into the conservation studio, where some of the artifacts had been set out. "I was like a kid at Christmas," she says. ▶

STEPHEN VOSS / WPN

Curators Bryna Fryer, left, and Christine Kreamer examine a Dogon stool (a Bamum mask, foreground).

AFRICAN ART

{ CONTINUED FROM PAGE 29 }

She picked up a 14-inch-high cylindrical wooden stool. Its circular seat and base were supported by four pairs of carved female figures with their arms upraised. She'd seen pictures of it before. The African art collection, amassed in the 1960s by New York City real estate mogul Paul Tishman and sold to Disney in 1984, is one of the world's most significant, and the catalog is a standard reference work. Kreamer recognized the stool as a prized late-19th-century artifact made by the Dogon peoples of the central plateau region of Mali. But Kreamer and other researchers didn't know exactly how it was used.

Previously known to curators only from a photo, a Nigerian mask, Freyer says, now seems more aggressive.

Then she noticed that the support post at the center of the stool had been finger-painted in a distinctive red, black and white matrix-like pattern that, she says, is found on shrines and ritual objects. Also, the top of the stool had a stain on it, possibly caused by a water and millet flour mixture typically used in Dogon religious ceremonies for offerings to ancestors and the spirit world. Kreamer speculates that the stool may have served as an altar. "Curators and conservators can read all they want," Kreamer says. "But until you confront the object face to face, you don't really have a sense of it."

Disney originally purchased the works for display at its Epcot theme park, in Orlando, Florida. But the company never went through with the exhibition, and most works remained in storage. This month, the museum will exhibit 88 pieces—the largest showing of the artifacts in two decades.

Among the mysteries that the museum researchers are delving into is one concerning a 13-inch-high stone carving of a human figure with beetle-like wings. Tishman purchased the piece from a dealer who said it probably came from Great Zimbabwe, the capital of a 13th-century African empire. If so, the work would be just one of a dozen surviving carvings from the city, which was looted in the 19th century. In October, curators using a stereomicroscope found that the statue was carved from metamorphic rock, not soapstone as originally believed. The finding brings the scholars closer to connecting the work to the ruins of the city, and over the next year they hope to cut out a coin-sized sample that will help to conclusively establish whether or not the stone is from quarries near Great Zimbabwe, located in the south-central part of present-day Zimbabwe.

The collection is a boon to researchers, with exhibition co-curator Bryna Freyer saying that the accumulating findings are like "raindrops that together will form a large lake of knowledge." Take, for instance, the amber-colored eyes of a late-19th-century wooden crest mask worn by the Bamum peoples of Cameroon. Freyer and other Smithsonian scholars found that the eyes were made from the silk of a ground-dwelling tarantula's nest. Because the Bamum associate the spider with the supernatural, Freyer argues that the wearer of the two-and-a-half-foot-tall mask believed the item had prophetic powers. "We knew the mask had authority because it was big and scary," she says. "Now we think that it had authority because it was big, scary—and knowledgeable."

{ BY ULRICH BOSER }

FRANKO KHOURY / NATIONAL MUSEUM OF AFRICAN ART, SI; KEVIN WOLF

Yo! Sly Gives Gear, K.O.'s Museum Brass

Without giving away the ending of the latest Rocky movie, it's safe to say the old boxer is history: actor-writer-director Sylvester Stallone has donated several franchise items to the Smithsonian Institution. Rocky Balboa's black homburg hat, the crimson boxing robe he wore to fight Apollo Creed in the 1976 original, *Rocky*, a pair of boxing gloves and a pair of star-spangled shorts are now part of the "Treasures of American History" exhibit, housed at the National Air and Space Museum while the National Museum of American History undergoes renovation. At the donation ceremony in December, which coincided with the release of *Rocky Balboa*, the sixth and reportedly the last of the movies about the Italian Stallion, 60-year-old Stallone joked about joining the Smithsonian's dinosaurs. But to have Rocky paraphernalia become part of the collection, he said, testified to the power of fictional characters: "It's amazing. Here we are right next to George Washington's military outfit."

{ BY KATY JUNE-FRIESEN }

Rocky "is part of everybody," said Stallone (with curator Dwight Bowers, left, and museum director Brent Glass).

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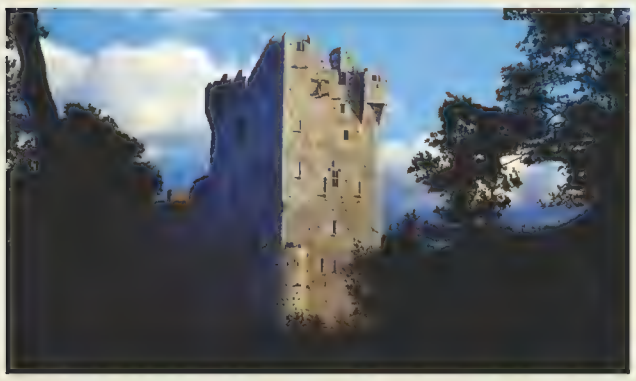

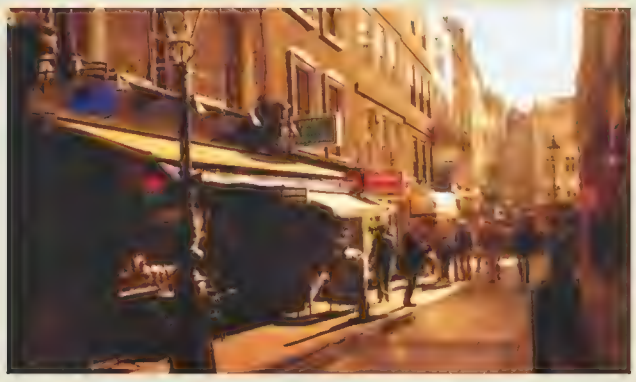

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FROM THE SECRETARY

Out of Africa

This month a special collection—representing most of Africa's major artistic traditions—goes spectacularly on view

TWO EXQUISITE PIECES OF ART—an ivory female figure and a copper-alloy mask, both from the African Kingdom of Benin in Nigeria—provided the spark for a lifelong love and pursuit of African art for real estate developer Paul Tishman and his wife, Ruth. For 25 years, they gathered works from the major artistic traditions on the African continent. The result is a magnificent private collection.

Thanks to a very generous gift from the Walt Disney World Company, which has owned it since 1984, all 525 pieces of the Walt Disney-Tishman African Art Collection now belong to the Smithsonian's National Museum of African Art (NMAfA). Starting this month and running through next year, 88 of them will be displayed in an exhibition called "African Vision." Every piece in the exhibition will also be included in a full-color catalog (available for purchase through the Web site listed at the end of this column).

The exhibition and the Walt Disney-Tishman African Art Collection are an enormous source of pride for the Smithsonian. Not only does the collection reflect a broad swath of African art, but many of the items in it are historically important. Among them are a carved ivory hunting horn from Sierra Leone dating to the late 15th century and a wooden figurative sculpture from Cameroon that was one of the first African artworks ever displayed at the Louvre. Included also are traditional African masks and objects, large and small, that have never been exhibited before. Spanning five centuries and representing some 75 peoples and 20 countries, the Disney-Tishman collection is now unmatched as a private collection in its diversity and breadth. According to both scholars and art historians, its individual objects have shaped modern art, and the collection as a whole has defined African art.

The Disney-Tishman collection's importance can be traced directly to the Tishmans. They believed deeply that even a private collection should be accessible to the public. In fact, it was the desire to share the art with as many people as possible that led them to sell their collection to the Walt Disney Company. (Paul Tishman died at age 96, in 1996; Ruth Tishman died at age 94, in 1999.) The original plan was for a permanent exhibition space at Walt Disney World. While that dream never came to light (animators did, however, study pieces while making *The Lion King*), Disney continually lent collection pieces for exhibition and publications. Then, when the company decided to pass the collection on and was approached by many museums, it chose the Smithsonian.

Making such art available to visitors from all over the world is an important part of the Institution's mission as well as the particular focus of the National Museum of African Art, America's only museum dedicated to the collecting, conservation, study and exhibition of traditional and contemporary African art.

Through "African Vision," museum programs, and the lending of pieces to Smithsonian Affiliates and other art institutions throughout the world, NMAfA will honor both the Tishman tradition and the legacy of James Smithson, the Institution's founding benefactor. That is why there is not a more fitting home for what the museum's director, Sharon Patton, has called the Disney-Tishman collection's "coming out party."

On exhibit: top left, a figure from the Edo peoples of Nigeria; top right, a reliquary guardian figure from the Kota peoples of Gabon; and, bottom, a mask, possibly from the Efik peoples of Nigeria.

When Paul Tishman was asked about his passion—about why he and Ruth collected art, specifically African art—he often responded with a question of his own: "Why do we fall in love?" After studying the artworks on this page, on pp. 29-30 ("Cache Value") and on the Web site listed below, we think you'll agree that his was the perfect question—and answer.

LAWRENCE M. SMALL
SECRETARY OF THE SMITHSONIAN INSTITUTION

For more pictures from the exhibition, visit Smithsonian.com.

CAMERON DAVIDSON; FRANKO KHOURY / NATIONAL MUSEUM OF AFRICAN ART, SMITHSONIAN INSTITUTION (3)

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THE OBJECT AT HAND | Cornell Box

SMITHSONIAN AMERICAN ART MUSEUM

PAS DE DEUX

Joseph Cornell turned his obsession with a prima ballerina into art

BY OWEN EDWARDS

PICTURE A MAN living in a small house on Utopia Parkway in Flushing, Queens, just across the East River (and worlds away) from Manhattan. He is in his late 30s and lives with his mother and an invalid brother. On a given evening in the winter of 1941, he climbs the stairs to the elevated train that will take him into what people in Queens still call "the city," where he will attend the ballet, as is his habit.

Perhaps he has chosen to attend Tchaikovsky's romantic *Swan Lake*, a favorite of balletomanes. And perhaps, on this particular evening, he will watch a dazzling young ballerina dance the demanding Black Swan pas de deux and, seeing her spin dizzyingly on *pointe*, will feel his heart beat faster.

But the admirer watching the graceful swan was not just anyone. He was the unique and eccentric artist Joseph Cornell, and if not exactly a man about town, neither was he, as some biographers have suggested, painfully shy. "The picture of a person withdrawn from the world," says art historian Lynda Hartigan, of the Peabody Essex Museum in Salem, Massachusetts, "is not a characterization of Cornell that I find accurate or useful." Hartigan, along with curators at the Smithsonian American Art Museum (SAAM), organized the current traveling exhibition of Cornell's works.

While other men may have daydreamed about ballerinas, Cornell transformed his appreciation into art; in 1946 he produced a box construction that he called *A Swan Lake for Tamara Toumanova: Homage to the Romantic Ballet*. (Today, it constitutes one of 177 works included in the show, installed at SAAM through February 19.)

Toumanova (p. 36) was a superstar, back when the word was still reserved for the extraordinary. Born in Russia (in a boxcar, she claimed), the daughter of a czarist military officer and his wife who were fleeing the Bolsheviks, she grew up in Paris and danced at the Paris Opera at the age of 9. According to the dancer's 1996 obituary in the *New York Times*, a prominent Parisian critic described her dancing as "astonishing" and "frightening." She was famous at 13, a protégée of legendary choreographer George Balanchine, performing in London and New York. By the time Cornell constructed his homage to Toumanova, she was 27 years old and an international celebrity.

Hartigan says that Cornell was introduced to Toumanova in 1940 by the Russian émigré painter and theatrical designer Pavel Tchelitchev and likely saw her dance often in the early '40s. In the 1970s, Toumanova told Hartigan that she considered Cornell a friend; the pair, says Hartigan, "corresponded on and off for at least two decades."

The box dedicated to her measures 9 1/2 inches by 13 inches by 4 inches and contains another, smaller box with a window of blue glass, behind which a cutout of a swan from the photostat of an old lithograph drifts past a castle

Cornell's 1946 construction (right), an homage to the ballerina Tamara Toumanova, incorporated feathers from her costumes.

JOSEPH CORNELL STUDY CENTER, SMITHSONIAN AMERICAN ART MUSEUM; THE JOSEPH AND ROBERT CORNELL MEMORIAL FOUNDATION

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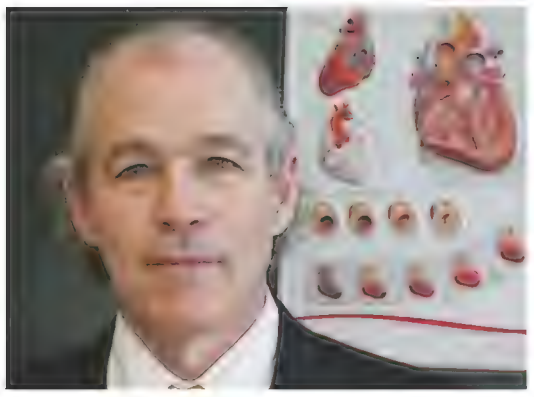
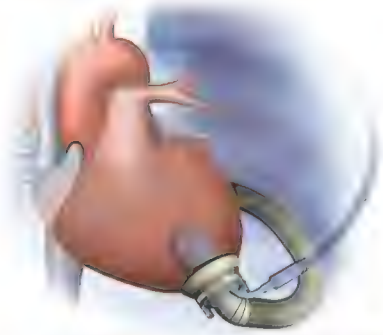


Q&A

Artificial heart inventor **ROBERT JARVIK** has donated his latest model, a Jarvik 2000, to the Museum of American History. He spoke with the magazine's Chai Woodham.

WHAT IS THE JARVIK 2000? It's a miniature rotary blood pump that we call an intraventricular artificial heart, which means it's a small booster pump that goes inside the natural heart. It's very sophisticated, and very quiet and effective. It's designed as a long-term artificial heart capable of supporting patients for many years.

IT'S CURRENTLY USED IN EUROPE FOR THAT PURPOSE. WHAT ABOUT IN THE UNITED STATES? We haven't requested permission for permanent use in the U.S. yet. It is presently used here as a temporary treatment for severe heart failure while the patient is waiting for a heart transplant. I expect the FDA will approve a clinical trial for permanent treatment later this year.



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CAN WE EXPECT ANOTHER BIG INVENTION FROM YOU IN THE FUTURE? No. It's no longer like Edison's times. He had a large team of people working in essentially virgin territory. I don't expect to be lucky enough to come up with anything else that has nearly the impact of the artificial heart.

Visit Smithsonian.com for more of the Q&A with Robert Jarvik.

Great Cat Diplomacy

How does a lionkeeper make introductions? "Very carefully," says Jeanne Minor of the National Zoo, which recently acquired three young lions (including sisters Shera and Nababiep, below) from a wildlife preserve in South Africa. Because the Zoo's 15-year-old lioness, Lusaka, is apt to fight the newcomers over territory, staffers go slowly. The animals first meet separated by a "howdy gate," a mesh barrier that lets them see and smell each other. Acclimating the lions could take up to six months. "I'm optimistic that they'll be able to live together," says curator Belinda Reser. Though a top predator, lions are classified as a vulnerable species, with the wild population estimated at just 23,000 to 39,000 animals. The Zoo's new arrivals will be part of the Species Survival Plan, a breeding program to guard against extinction. { BY AMY CRAWFORD }

(thus echoing the ballet). The intricate box, lined with blue velvet, contains pieces of mirror mounted on the rear surface. The larger box features several white feathers, which Hartigan notes were taken from one of Toumanova's costumes. The dancer told the art historian that in those simpler days, Cornell would occasionally wait in the wings, scissors in hand, to snip bits from her ensembles.

By the time they met, Cornell, whose first one-man exhibition opened at the Julien Levy Gallery in New York in 1932, was a well-respected artist, admired by prominent Surrealists. He was as well known in his world as Toumanova was in hers, though he chose to work in almost cloistered privacy, on his kitchen table and in a basement space. His boxes are introspective miniatures, not muscular showpieces. Whatever the nature of their friendship, the stylistic distance between the genius and the goddess—one living quietly in a working-class borough, the other receiving "bravas" and bouquets night after night from frenzied fans—was in some sense unbridgeable.

Tamara Toumanova, c. 1940.

But Cornell must have imagined that there might be something between them, or so it would seem. The letters he wrote to her often bore red heart decals. When the dancer married screenwriter Casey Robinson in 1944, the letters continued but the hearts disappeared—only to return when Toumanova's marriage ended in divorce ten years later.

Cornell died in 1972, at age 69 at home in Flushing, 24 years before Toumanova, who spent her last days in Beverly Hills, living out a genteel retirement. He had never married.

OWEN EDWARDS *is a freelance writer and author of the book* Elegant Solutions.

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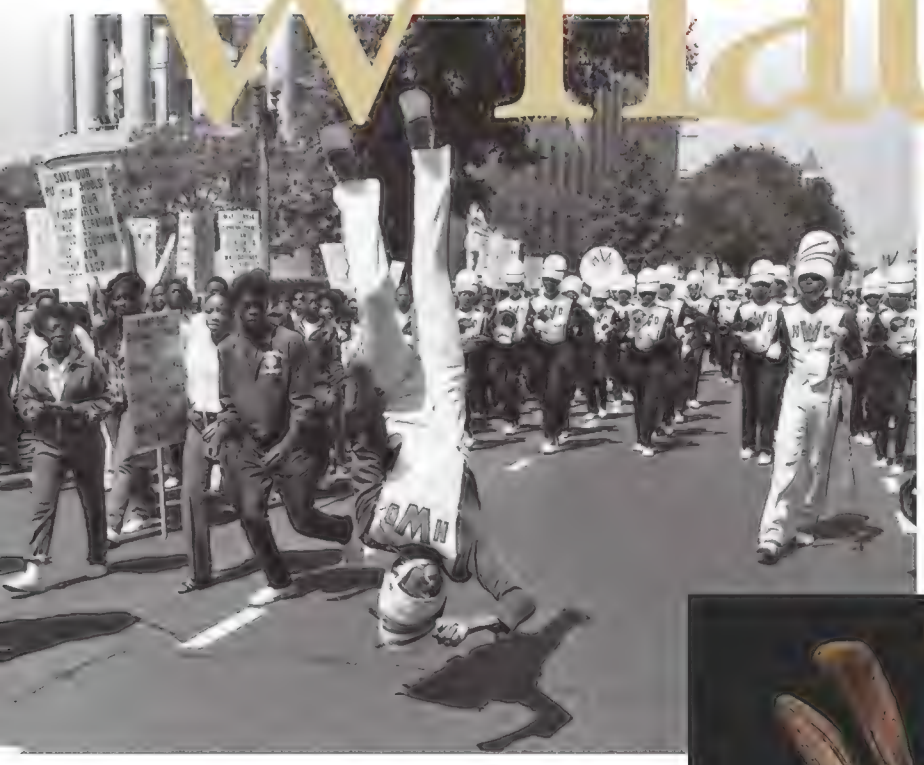

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{ BY AMY CRAWFORD }

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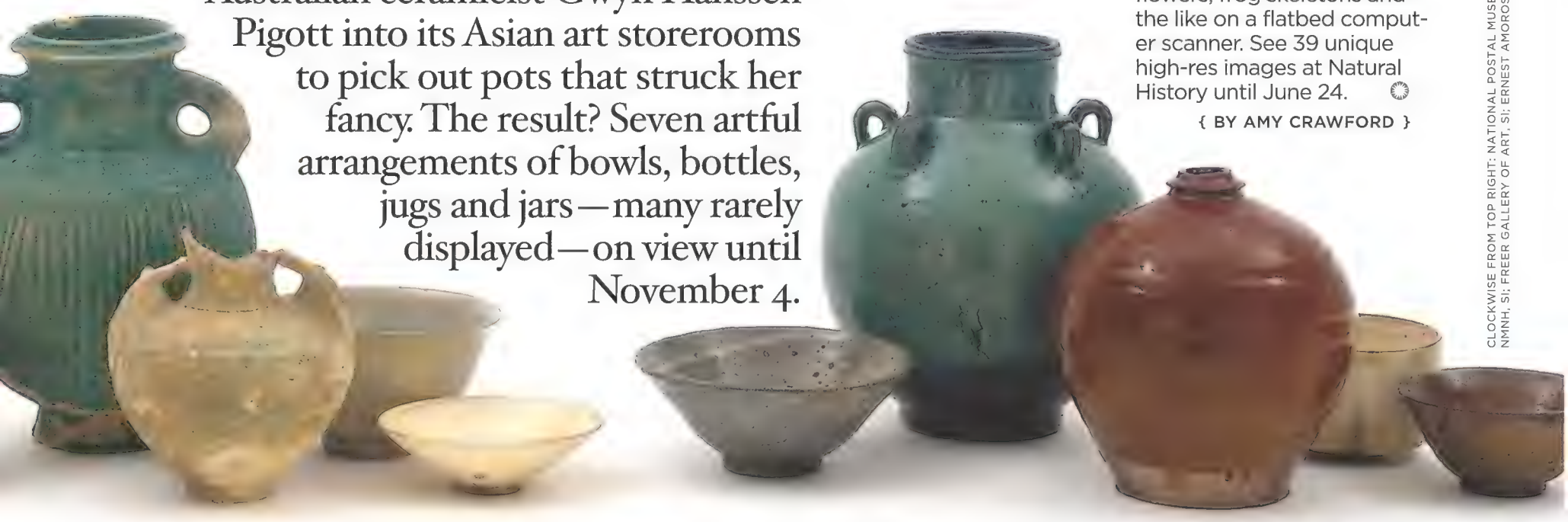

CLOCKWISE FROM TOP RIGHT: NATIONAL POSTAL MUSEUM, SI; ROBERT CREAMER / NMNH, SI; FREER GALLERY OF ART, SI; ERNEST AMOROSO / NMAI, SI; MILTON WILLIAMS

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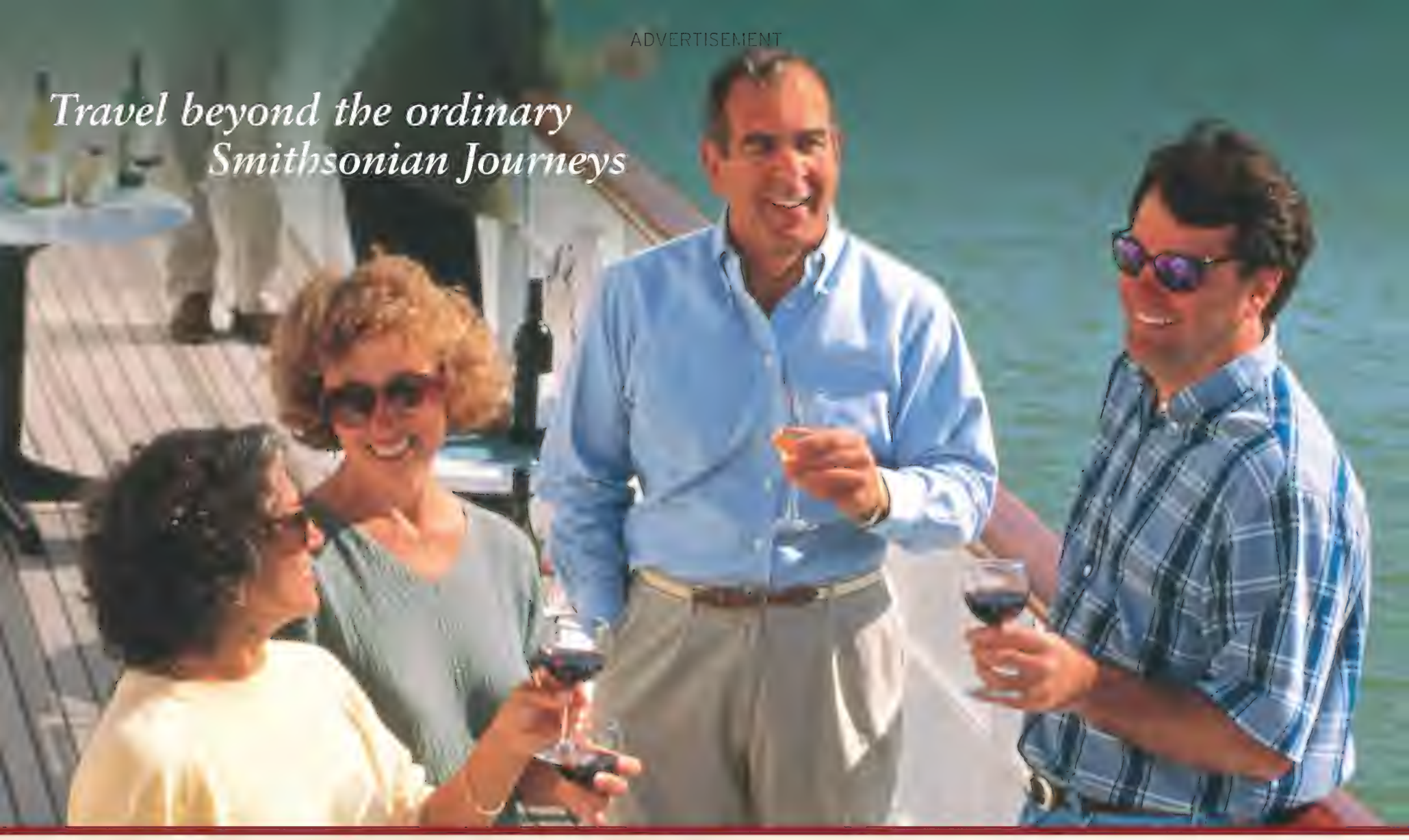

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Death in Happ

A son of the colonial aristocracy goes on trial for killing a poacher in Kenya, where an exploding human population is heightening tensions and stretching resources to the breaking point

BY RICHARD CONNIFF

PHOTOGRAPHS BY PER-ANDERS PETTERSSON

ONE AFTERNOON last May, a bearded 36-year-old black man named Robert Njoya set out with friends to hunt for bush meat on a private ranch called Soysambu, in the heart of Kenya's Great Rift Valley. They brought along a pack of dogs for running animals into wire snares, and they carried an iron bar for clubbing their catch, and pangas, or machetes, for butchering the meat.

That same day, a 38-year-old white man named Tom Cholmondely, whose family has owned and managed Soysambu for almost a century, was touring the 48,000-acre property with a friend. He carried a 30-06 rifle loaded with soft point bullets, as a precaution against buffalo.

Late that afternoon, in a dense stand of acacia trees and lelechwe bushes, the two parties crossed paths. Cholmondely knelt and fired a series of shots. Two dogs died on the spot. One bullet also hit Njoya, who was carrying a partly butchered

Jokim Githuka, 3, displays a portrait of his dead father, Robert Njoya, in a Kenyan maize field. Other sons stand by his grave with Njoya's widow, Serah. The trial of his undisputed killer, Thomas Cholmondely, has electrified this former British colony.

y Valley

Smithsonian
{ FEBRUARY 2007 · VOLUME 37, NUMBER 11 }

THE STANDARD
OUTSTANDING EVERY DAY
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impala. The bullet entered the outside of Njoya's upper left buttock, burst through the pelvic girdle, lacerated the femoral artery leading to the left leg, cut the sacrum in half, shattered the pelvic girdle on the right side and lodged in the muscle between hip and waist. Soon after, at a hospital up the road, Njoya was dead, of massive bleeding.

It was the second time Cholmondely had shot and killed a black man on the ranch in little more than a year. The first incident had passed without criminal charges, because Cholmondely said he had mistaken the victim, a wildlife officer, for an armed robber in an area where robberies are epidemic. But this time much of Kenya erupted in outrage. Cholmondely (pronounced Chumley) suddenly looked like a throwback to the arrogant behavior of early British colonists, notably including his own great-grandfather, Hugh Cholmondely, the third Baron Delamere, unofficial leader of the British settlers who began arriving in Kenya in 1903. In the aftermath of the Njoya killing, politicians proposed stripping the family of Soysambu and distributing the land to poor farmers. Police took Cholmondely away to prison in Nairobi, where he is currently on trial on a charge of murder, with a maximum penalty of death by hanging.

The Njoya killing was only the latest incident in a wave of violence around the lakes of Kenya's Great Rift Valley. In another notorious case, a few months earlier and a few miles down the road, a gunman armed with an AK-47 had slain Joan Root, the noted filmmaker and conservationist, in her bedroom overlooking Lake Naivasha. Police called it a robbery. Friends said it was a contract killing provoked by her highly public efforts to keep poachers from destroying the fish in Lake Naivasha.

The violence seemed to pitch whites against blacks. But race was largely incidental to the underlying issue—the struggle to protect wildlife, water and other resources, in the face of a rapidly expanding human population desperate to feed their families. Longtime residents of the lakes remembered when they could lie in bed and hear lions roar, and when herds of large animals still wandered freely there. But now it seemed as if people were fighting and dying their way down to the bottom of the food chain. Nor was the body count limited to human beings and the animals they eat. Throughout 2006, the vast flocks of flamingos for which the lakes are famous were also falling victim to a malady puzzled scientists dubbed "the pink death." Robert Njoya and Joan Root were thus merely the most prominent victims in what some valley residents were beginning to fear might be a broad ecological collapse.

At least in the imagination, few places on earth seem as vast and unchangeable as the Great Rift Valley. It's a broad seismic cleft running much of the length of Africa, from Ethiopia down to Mozambique. Astronauts in orbit have described it as one of the earth's most visible geologic features. Paleontologists have celebrated it as the birthplace of humanity, because of the discovery of Lucy and other early hominid fossils there. Writers also have dwelt lovingly on the Great Rift Valley, particularly on the area in Kenya from Lake Naivasha up through lakes Elmenteita and Nakuru. This picturesque landscape was pioneer territory for the hunters and settlers in Karen Blixen's *Out of Africa*. And it became infamous in books such as *White Mischief* as "Happy Valley," where aristocratic settlers, including Lord Delamere himself,

The Great Rift Valley of Africa, with a history reaching back to the earliest hominids, held a special attraction for such swashbuckling colonial settlers as the cigar-smoking Rt. Hon. Lord Delamere (above, left). Arriving with the first 20th-century settlers, he helped set the pace in and around Kenya's Happy Valley, a dramatic landscape favored by big-game hunters, hard-drinking adventurers and plantation owners such as Karen Blixen (above, right). Blixen, aka Isak Dinesen, evoked that era in *Out of Africa*. Population pressures have since strained the region, where pink flamingos (opposite, above, on Lake Nakuru in 2005) have thinned. Tom Cholmondely, the future Lord Delamere (above, center, with his parents on their Soysambu ranch), was embroiled in poaching disputes before being charged with killing a black neighbor.

ROBERT CAPUTO / AURORA; MIKE REAGAN; P. 42 FROM THE BOOK *WHITE MAN'S COUNTRY* © ELSPETH HUXLEY (1935, 1967). GREENWOOD PUBLISHING GROUP / PRAEGER; DARIO MITIDIERI / GETTY IMAGES; RUNGSTEDLUND FOUNDATION. FROM THE BOOK *OUT OF AFRICA*. CROWN PUBLISHERS (1987)

indulged in a movable feast of drugs, drink and debauchery.

From Nairobi, it's now a two-hour trip out to the lakes, and my driver, a 48-year-old Kenyan named Jagata Sospeter, turned the journey into a chronicle of loss. At Mimahu, where the left side of the road suddenly opens up to reveal the broad, dusty bottom of the valley far below, he said, "In the 1970s, there were no houses here. It was all forest. I used to come here on foot." At Maingu, where young men played soccer on a marsh dried out by years of unreliable rainfall, he said, "We had rhinos here 20 years ago. There was very much water then." And crossing the Malewa River, he added, "It used to have hippos. But now the water is very low."

Kenya's human population has doubled since 1980, to 35 million, and much of it now sprawls out along the A104 highway, turning the open spaces of the Rift Valley into a patchwork of shambas, tin-roofed farmhouses surrounded by an acre or two of parched maize plants. In the booming agricultural centers of Naivasha and Nakuru, newcomers have thrown together dense slums of stone and scrap lumber. On the outskirts, pockets of red-tile roofs appear on the sort of prosperous houses you might find in a California exurb. Every stretch of bare soil sports a hand-painted real estate sign: "Plots for sale."

Since the mid-1980s, Naivasha has become the center of

RICHARD CONNIFF *wrote* The Ape in the Corner Office: Understanding the Workplace Beast in All of Us *(Crown).* *Photographer* **PER-ANDERS PETTERSSON** *is based in Cape Town.*

Kenya's flower export industry, attracting European companies with its low wages, rich volcanic soil and water from the lake. Greenhouses for roses and chrysanthemums now crowd the shoreline in tight formation. From a distance, it can seem as if Mount Longonot, a defunct volcano, has spilled down a seamless lava flow of plastic sheeting. Women in bright green work coats walk to and from flower farms along the road. They've come from all over Kenya, with thousands of others still unemployed, for jobs that pay $72 a month.

ACCORDING TO HER FRIENDS, Joan Root didn't so much resist this change as attempt to moderate its worst excesses. She and filmmaker Alan Root had bought an 88-acre farm beside the lake in 1963, when they were a young married couple and Naivasha was still a backwater. They used it as a retreat when they weren't off in the bush filming wildlife.

Alan and Joan Root had made their name as one of the most successful natural history filmmaking teams in the business. He dreamed up stories for the BBC or *National Geographic*, and she organized the details to make them happen in the field. After the marriage ended in the 1980s, the farm became a sanctuary both for Joan and for the wildlife that were her great passion. Hippos still snarfle in the dense stand of papyrus along the shoreline there. Dikdiks, a type of mousy little antelope, graze on the front lawn. A pair of crowned cranes pester staffers for food.

At the farm, Root gradually took up a new life as a conservationist. The lake itself was shrinking because of the demand from the flower farms and their workers. Small farmers in the surrounding hills were also stripping away the forests and diverting tributaries for irrigation. Lake Naivasha, once so clear you could see to the bottom, had turned murky with agricultural runoff and overflowing pit latrines.

Root focused her efforts on poachers who threatened to empty the lake of fish with their nets. They also cut down the dense lakeshore papyrus, to avoid being ambushed by hippos and buffalo hiding there. Root tried to explain that the water around the papyrus served as the nursery for next year's fish. She advocated things like gill nets with a bigger mesh, so smaller fish could get through and live to breed. Root enlisted the poachers themselves to patrol the lake as a private anti-poaching task force. Friends told her it was foolish to become so personally identified with the task force. Her efforts caused the entire fishery to shut down for a year of recovery. "It was very easy to turn around and say, 'Because of that bloody woman, we've lost our livelihood,'" said Adrian Luckhurst, a friend and business partner. Getting in the way of that livelihood could be dangerous.

Root's house, now closed up, is a modest one-story structure in a stand of tall, graceful yellow-fever acacia trees. It has a rusting tin roof, and the skull of a hippo gathers dust in a corner of the porch. An *askari*, or watchman, named Khalif Abdile, patrolled the property the day I visited. He was recovering from a hippo attack and bent his slender frame into a frail stick that served as a cane.

Abdile was the askari on duty the night in January 2006 when Joan Root was shot to death. He pointed out the fork of a fallen tree where he'd been lying, his head on one trunk and his feet on the other, when two intruders first appeared around a stand of bushes a few feet away. One carried a panga, the other an AK-47. They wore hoods to hide their

Ranks of greenhouses crowd the shores of Lake Naivasha, where commercial flower-growing has mushroomed in the past two decades (opposite, above). Roses, chrysanthemums and other plants grown here are exported worldwide. The flower farms provide low-wage jobs for local people, who have migrated to the region seeking work. They often live in crowded communities (opposite) and supplement their livelihoods by intensively fishing the lake. Many also hunt wild game illegally to get meat or much-needed money for their growing families. Longtime Lake Naivasha resident, renowned filmmaker and conservationist Joan Root (above, left) ran headlong into trouble when she fought back against poaching and overfishing in the region. She was shot to death in a night attack at her farmhouse (above, center).

MARY ELLEN MARK; PER-ANDERS PETTERSSON / GETTY IMAGES

PER-ANDERS PETTERSSON / GETTY IMAGES (2)

faces. Abdile pressed a button, setting off a noisy alarm atop the house and sending a telephone alert to a private security force. The intruders briefly debated whether to find and kill the askari, but then proceeded instead to the house. "Let's do the work," Abdile heard one say.

Abdile retraced their footsteps for me from window to window around the house. At the back of the house, they opened a gate to a tortoise compound and walked up to Root's bedroom. The AK-47 blew open the lock on an outside door leading to the bathroom. But a steel security door just inside stopped them. Then, said Abdile, they broke open a bedroom window and started talking to Root: "Open the door and we won't kill you. We just need the money." They moved to another window, where Root was now on the phone calling for help. The gunman sprayed the room with bullets, hitting Root and knocking her to the floor. Then the two of them turned to leave, thinking they had killed her.

But Root had only suffered a wound to the thigh, and now, said Abdile, she reached for a flashlight, perhaps to find her mobile phone or her eyeglasses. ("That was Joan," an American friend said later. "She always had a flashlight nearby.") One of the attackers saw the light come on and said, "She's still alive." They turned back and the gunman fired again through a window as Root dragged herself around the bed toward the bathroom, where the high windows and the steel door promised refuge. Hit by more bullets, she died, at age 69, on the bathroom floor.

Police quickly traced the assailants to a slum called Karagita, a few miles up the road. Among those the police arrested was a former poacher who had become Root's right-hand man on the anti-poaching task force.

IN THE HANDSOME neo-Classical law courts building in downtown Nairobi, the trial of Tom Cholmondely in the killing of Robert Njoya proceeded by fits and starts. Justice Muga Apondi was hearing the case without a jury, during a week of testimony in September, another week at the end of October and another in early December. No one seemed to

be in any hurry, least of all the defense, perhaps in part because public outrage about the case seemed to fade with each passing month. Cholmondely, the future sixth Baron Delamere, sat on a wooden bench at one side of the courtroom throughout, tight-lipped and expressionless. He was tall and lean, with thinning blond hair and blue eyes, cast down, behind rimless glasses. He wore a beige suit, with a paisley tie, a red handkerchief in the breast pocket and a pair of handcuffs.

HIS FRIENDS, both black and white, described Cholmondely as an ardent conservationist. He helped found the Nakuru Wildlife Conservancy, to help protect Lake Nakuru National Park just north of Soysambu. He also went out of his way to enlist a black neighbor among the founding members. He worked closely with the park on poaching problems, and Kenya Wildlife Service (KWS) appointed him an honorary game warden. Though Soysambu was a working cattle ranch, Cholmondely also maintained a huge area around Lake Elmenteita as a wildlife sanctuary. Like the rest of Soysambu, it was dusty, infertile soil and littered with volcanic rock. But it harbored about 10,000 head of antelope, zebras, buffalo and other species. The lake itself would also normally have served as a feeding area for dense flocks of lesser flamingos—except that, like other Rift Valley lakes, Elmenteita had lately dried away almost to nothing.

Cholmondely's defenders said that he maintained good relations with the local community. The family built schools and medical clinics on the ranch and donated land for a secondary school in a nearby village. Unlike some other white farmers, Cholmondely also hired black Kenyans as managers of Soysambu and other family businesses, and he spoke to them in fluent Swahili.

But questions of temper and judgment repeatedly surfaced, too, sometimes in connection with firearms. A neighbor recalled the time that Cholmondely fired a handgun at the dartboard at a local drinking club, possibly an act of homage to his great-grandfather, who once rode a horse into Nairobi's Norfolk Hotel and shot out the whiskey bottles behind the bar. An acquaintance recalled an angry outburst over

PER-ANDERS PETTERSSON / GETTY IMAGES (4)

a mechanical difficulty on a trip in Cholmondely's Cessna: "He's the only pilot I've ever seen shouting at his plane before takeoff. I talked to the other passengers after, and they said, 'There's something wrong with that guy.'"

Cholmondely's temper seemed to show itself particularly when it came to the wildlife on Soysambu. Under Kenyan law, all wildlife belongs to the state, not the landowner, and hunting of any kind has been illegal since 1977. But until recently, KWS allowed landowners to "crop" and sell, usually for meat or hide, a quota of excess animals each year. The first time I heard about cropping I thought it was a dull land management issue, miles apart from questions of murder. But it turned out to be the reason Tom Cholmondely got into trouble with the law in the first place.

The legal trade in zebra and other species could at times be more profitable than cattle ranching, and landowners saw it as fair compensation for the cost of having wildlife on their land. That cost could be considerable. For example, one environmentalist was deeply vexed with zebras: "They're greedy—you never see a thin zebra—and they're excitable. They race around tearing up the ground and no fence can stop them." The landowners didn't want to get rid of the animals. They just wanted to harvest a percentage of them when the population got too big for their property, and they could argue passionately about what that percentage should be. A Cholmondely neighbor, Christopher Campbell-Clause, said he once saw Cholmondely get into a "standup confrontation" with a local game warden about increasing Soysambu's quota: "Tom got so incensed that he finally threw the contents of his briefcase on the floor, stomped on his pens and stormed out."

But the cropping program also elicited passionate feelings among critics. "It sends the wrong message," said Clause. "Probably a white man, and certainly a rich man, can take advantage of the wildlife, whereas the poor man across the border is convicted of poaching if he takes a dik-dik to feed his family." Critics also alleged that some landowners were abusing the privilege. So KWS ended the cropping program in 2003. At that point, the only people who could profit by taking wildlife were the poachers.

And that may have caused Cholmondely himself to become a poacher, albeit on his own land. "Tom Cholmondely was so arrogant," said Clause, "that he carried on cropping even after KWS banned it." KWS got wind of this allegation, according to the police, and on the afternoon of April 19, 2005, a team of undercover KWS agents went to the slaughterhouse at Soysambu to see if they could make a purchase. They found a buffalo carcass being butchered, and they arrested the slaughterhouse crew. Somehow, word got to Cholmondely that robbers, not KWS agents, were holding his workers at gunpoint—only a week after actual robbers had killed a flower farm manager in Naivasha.

"And that's when Tom went wild," said Simon Kiragu, superintendent of police in Naivasha. "He came running like a wounded buffalo. He didn't just come, he came firing," with a pistol in hand. Outside the slaughterhouse, he saw a stranger, a Masai named Samson Ole Sesina, with a handgun, beside an unmarked car. Sesina apparently fired, too, then ran, leaping over a fence into a corral. Cholmondely fired again. A bullet hit Sesina in the back of the neck and came out his mouth, killing him instantly. "I remember there was blood, blood, blood," said Kiragu.

Impala wander the range at Tom Cholmondely's Soysambu ranch, a 48,000-acre spread his family has owned for more than a century (opposite, above). Competition for resources is fierce in this once-bountiful corner of Kenya, where more fishermen work longer at their nets to catch fewer and smaller fish each year (opposite). A desperate hunger for protein keeps poachers from thinking much about long-term resource management. Guards at Cholmondely's sprawling estate (above and left) have been unable to shield it from violence. In 2005, Cholmondely shot and killed a Masai wildlife officer, believing him to be a robber. In May 2006, the rancher was jailed after shooting another intruder at Soysambu. "People were sympathetic" after the first shooting, a colleague said. "After the second, people despaired of him."

It quickly turned out that Sesina had been a KWS employee, a driver for the undercover team. After his arrest, Cholmondely apologized: "I am most bitterly remorseful at the enormity of my mistake." The government opted not to prosecute because of the confused circumstances of the killing. Later, following Kenyan tradition, Cholmondely made a settlement with Sesina's family, reportedly paying the equivalent of 49 head of cattle—livestock being the traditional Masai measure of wealth.

"After the first incident, people were sympathetic," said Clause, who worked with Cholmondely on wildlife issues. "After the second, people despaired of him. He's a trigger-happy young guy, acting completely beyond the law." I told Clause that no other landowner had been willing to come down so hard on Cholmondely. "Too many people say we must stick together as white people in Africa," Clause replied. There was a simple solution to the poaching problem, he went on, and it didn't involve guns. At the Kigio Wildlife Conservancy, which he manages, employees put up a ten-foot-high solar-powered electric fence around the entire 3,500-acre property. It wasn't cheap, and it certainly did not jibe with old notions about the endless African wilderness. But poaching ended overnight.

ONE DAY LAST NOVEMBER, a caravan of vehicles set out from Nairobi toward Soysambu, where the entire court in the trial of Tom Cholmondely would be visiting *locus in quo*, as the periwigged lawyers put it—at the scene of the killing of Robert Njoya. The testimony that week had been more farce than melodrama. It had also provided an inadvertent demonstration of why getting a conviction for murder in Kenya can sometimes prove difficult.

Joseph Ubao, the first policeman to arrive at the scene the night of the killing, had stepped into the witness box with a swagger. He drew in a deep breath as if to summon up strength for what was clearly his great moment, then testified in phrases so carefully polished he often felt compelled to repeat them, softer the second time around, to savor the effect: "It was during the endeavor to shoot yet another dog that the bullet he was firing got the injured man."

At one point, the prosecutor handed Ubao Cholmondely's rifle, so he could identify what he had described as a magazine for automatically loading bullets into the chamber. Ubao inspected the weapon closely, turning it at various angles and even fiddling with the telescopic sight, inspiring so little confidence that the clerk of the court actually ducked. Finally, he said, "Correction, my lord, the gun does not have a magazine." It was as if the prosecution had set out to embarrass its own witness.

Then Cholmondely's lawyer moved in. Fred Ojiambo, the top litigator at the most prominent law firm in Kenya, posed his questions gently, and waited for the answer with mouth open, as if in anticipatory disbelief. He asked Ubao to name the parts of a rifle, including "that little fiddly thing," which Ubao identified as the trigger. But Ubao had no idea what to call "that contraption on top," the telescopic sight, and eventually admitted that he had mistaken it for a magazine. Ojiambo went on to demonstrate that the policeman hadn't cordoned off the scene of the killing, hadn't taken proper notes and still couldn't correctly identify the caliber of the rifle. Afterward, even Cholmondely's mother murmured, "The poor man."

At Soysambu a few days later, the procession into the bush included Cholmondely, his jailers, family, friends, reporters, photographers, television cameramen, soldiers with automatic weapons and riot police with face masks and plastic shields. Soysambu staffers trailed along the edges, picking up poachers' snares as they went. I lost count at 30. As we walked, I chatted with a friend of Cholmondely's, who described the spate of armed robberies and shootings at Soysambu in the months leading up to the Njoya killing. The friend's intent was clearly to show that there were circumstances to mitigate the enormity of Cholmondely's second fatal mistake. And in truth, it would have been hard not to empathize.

A woman named Sally Dudmesh joined the conversation. She had lived at Soysambu with Cholmondely since the breakup of his marriage. In the months after the Ole Sesina killing, she said, attackers had shot and wounded a ranch manager and then, in a separate incident, his successor. But what had unnerved everyone, Dudmesh said, was an attack on a Soysambu mechanic named Jusa. Cholmondely called Jusa's mobile phone. But the robbers had stolen it. "Where's Jusa? Where's Jusa?" Cholmondely yelled. According to Dudmesh, the robbers saw Cholmondely's name come up on Jusa's mobile phone. "They said, 'We've just killed him and now we're coming to kill you.'" Cholmondely went out to patrol around the house, leaving two women with four children, including his own two sons, inside. "I said, 'Why don't we just run?'" Dudmesh recalled. "The mother of two of the children said, 'You can't run with four children under the age of 7.' It was one of the scariest moments of my life." In the end, no one came, and Jusa was unhurt.

But did empathy translate into exoneration?

By now, led by Carl Tundo, the friend who had been with Cholmondely on the fateful afternoon, the court had arrived at the scene of the killing. In the months after the shooting, Cholmondely's defenders had offered two arguments on his behalf. They said he'd been shooting at the poachers' dogs, standard KWS practice for game wardens, and that Njoya had been hit by a ricochet. They also said the poachers had turned their dogs to attack Cholmondely.

But Tundo's testimony suggested that the poachers had never had a chance to attack. He pointed to the spot where he saw Cholmondely suddenly drop to one knee and bring the rifle to his shoulder. In the thick underbrush, perhaps 40 feet ahead, there was a glimpse of movement and the sound of voices. "Then I heard a shot," he said. He turned and ran away, and the next thing he remembered was hearing Cholmondely shout to bring the car because he had "shot a man by mistake."

The most intriguing thing about Tundo's testimony was the question of visibility. Two ten-foot-high lelechwe bushes grew between Cholmondely's position and that of the poachers. With knee-high grass and overhanging branches, it looked as if Cholmondely would have had no more than a narrow window of visibility, roughly from knee to waist, on either side of the bushes. And yet the prosecution never asked what seemed to be the obvious questions: Would anyone who understood basic gun safety have fired a rifle here? And would Cholmondely have fired if he'd thought the voices belonged to white people?

Afterward, in Nakuru, I looked up the pathologist

In May 2005, wrapped in their traditional shaka, or plaid blankets, Masai warriors protested Cholmondely's first killing (above). At his trial, last year, for the second killing, a somber Cholmondely conferred with his periwigged attorney, Fred Ojiambo, one of the nation's top litigators (opposite, above). Ojiambo, fencing with prosecuting attorneys, is trying to keep his client from hanging for murder. In November 2006, a handcuffed Cholmondely revisited the scene of the crime with members of the court, police officers and the press.

SAYYID AZIM / ASSOCIATED PRESS; P. 48 ANTONY NJUGUNA / REUTERS (2)

who had performed the autopsy on Njoya. He said that the bullet had been intact when it hit Njoya, and that it had traveled a level course through his body. "So the ricochet theory?" I inquired.

"It's crap," he said.

ONE MORNING a little after sunrise, I walked out to a ridge overlooking Soysambu in the middle of the Great Rift Valley. Red hills and rocky bluffs rose up out of the parched landscape, and here and there a shoal of acacia trees swept through along a dry riverbed. Below me, a Masai herder wandered past with his goats, as Masai have always done in these parts. A monument on the ridge, built of rough volcanic stone, marked the grave of a British settler, Galbraith Cole, "buried here at his home in Kikopey in the making of which he laboured, loved and suffered much." Cole's house, now converted into a tourist lodge, stood behind me. On another ridge, a few miles away, I could see the modest home where Cholmondely's parents, the current Lord and Lady Delamere, still live. Everything else seemed timeless.

It was hard to fathom that this valley, and particularly its lakes, could be under siege. It was a siege being waged not just with guns and pangas, but also with greenhouses and fishing nets, and broad-bladed mattocks and makeshift irrigation schemes. To the west, on the flanks of the Mau escarpment, clouds cast pockets of shadow that looked like forest but weren't. Much of the forest, a national reserve, had been opened up to small farmers and cut down in the 1990s. "It made people happy, and politicians get elected by making people happy," Bernard Kuloba, a conservation biologist for KWS, had told me. But what the politicians had failed to calculate was that the Mau forest was the critical water source for two of the most celebrated natural areas in Africa, the Masai Mara reserve on one side, and Lake Nakuru National Park on the other. People were getting a few shillings' worth of maize, said Kuloba, but at the expense of tourist dollars—Kenya's second largest source of income—and drinking water.

That trade-off was happening all over this stretch of the Great Rift Valley. On the old Cole ranch in Kikopey, 7,000 people were ekeing out a living on the same arid land that supported perhaps 200 people a generation ago. A few miles uphill, the government had granted permits for two farmers to draw irrigation water from a hot spring—and 200 pipes had gone in instead, straws all sipping the same meager drink. All through the foothills, said Kuloba, rivers and streams now run dry long before they reach the lakes—except when rains and the lack of upland vegetation turn them into flash floods. As a consequence, Lake Elmenteita itself had dried away to a shallow puddle in the middle of a broad, bleached-out lakebed. And it was much the same at Lake Nakuru, a little to the north.

"If there's no water, the flamingos could die," Kuloba told me. He shrugged, to indicate the general public reaction. "And if there's no water for Nakuru town either? Then people will die too."

I thought he was overstating the case, until I went out to Crater Lake. It was one of two small lakes at the southern end of Lake Naivasha, neither of them normal flamingo habitat, where the birds had suddenly turned up in huge numbers in 2006. Biologists speculated that the falling water levels had changed the chemical balance of all the lakes, altering the population of bacteria on which the flamingos feed. The changing conditions may also have favored certain bacteria that produce a potent neurotoxin fatal to the birds.

From a scenic viewpoint above Crater Lake, the flamingos looked almost absurdly beautiful, lining the shore like pink icing on a big birthday cake in the middle of a desert. Then I hiked down to the lakeshore, and as small groups of birds skittered away across the water, I realized that scores of those left behind were dead. They lay with their elegant pink necks s-curving across the surface of the water, or folded back between their wings, as if in sleep. Hundreds more victims of the "pink death" lay heaped where someone had tossed them in the bushes. And if the flamingos were dying, what did that say about the second half of Kuloba's prediction?

The last place I visited in Kenya was the village of Kiungururia, where Robert Njoya used to live, on the north side of Soysambu. The border separating the village from the ranch was a line of dense, thorny cholla cactus, but with wide paths cut through it. In the course of perhaps 15 min-

utes, I counted five young men riding out of the ranch on bicycles stacked high with firewood. I didn't see anyone with bush meat, but Jeff Mito, a private investigator hired to improve security at the ranch, had assured me that poachers were there every day. "And the same people who come as poachers by day come and attack us by night," he added.

So I went to Robert Njoya's house still thinking of him as just a poacher, meaning a kind of thug. The house he had built consisted of mud-and-sisal walls, under a tin roof. Two pepper trees, with weaver nests hanging down, grew in the yard, which was hedged in by bougainvillea. Beyond the yard, Njoya had farmed a couple of acres of barely arable land subdivided from his father's farm. One of the children told me that this year's harvest had yielded a single sack of maize. There were four sons under the age of 9. If custom held, they would subdivide their father's land, in their turn.

Gidraff, the eldest, remembered his father: "He used to take us to town for town visits. He bought us footballs. He wasn't hard, but not too soft, either. Everybody had duties in the house. I was washing the dishes, Michael swept outside, John collected rubbish around the house. The baby would sleep. We would all go to dig in the shamba." Then they showed me Njoya's grave, a hump of earth beside the maize he had planted, with a wooden marker on which his name and dates and the letters "R.I.P" had been crudely painted.

Later, their mother, Serah, came home and invited me into the whitewashed living room. There was a small television. Wooden chairs draped with embroidered cloths lined all four walls. Robert, she said, had been "a hard-working man" who earned his living mostly as a mason, building houses. For a time, he also made dried flower arrangements for the export trade, sometimes using cactus from Soysambu. The meat he got from poaching, she said, was the only meat they ate.

She was a slender 28-year-old, her hair wrapped in a blue kerchief, with smooth dark skin and perfect white teeth, and she seemed incapable of anger. Of Cholmondely, she said, "If he came and asked me to forgive him, I would forgive him."

Then the 3-year-old, Jokim, ran into the room bawling at some injustice committed by his siblings, and she picked him up on the seat beside her, comforted him, wiped his nose, and launched him back out into the fray.

The children were still asking about their father, she said, "especially that one," referring to Jokim. But even Jokim understood their father would not be coming back. It had gotten into his mind that Tom Cholmondely was a pilot. Now, "when he sees an airplane overhead, he says, 'That is Tom Chol-mun-lee passing, who killed my father.'"

Long before white settlers established themselves in Kenya's Great Rift Valley, Masai herders dominated the grasslands, following their cattle through the seasons. Now more pastoral than nomadic, Masai continue to live off the land—the men and boys tending animals, the women making camp (opposite). Along the shores of Lake Elmenteita in recent years, many herders are turning from cattle to more efficient sheep and goats (above). Despite dwindling resources and mounting ethnic tensions, such indigenous cultures remain strong.

PER-ANDERS PETTERSSON / GETTY IMAGES (2)

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THE PARDON

President Gerald R. Ford's priority was to unite a divided nation. The decision that defined his term proved how difficult that would be

BY BARRY WERTH

President Richard M. Nixon's resignation created the Ford administration—and left Ford with the excruciating dilemma of whether to intervene in Nixon's legal fate in the Watergate scandal. In the book 31 Days, *published this past April, author Barry Werth provides a day-by-day chronicle of how the question took shape, and how Ford—who died December 26 at age 93—arrived at the decision that defined his "accidental" presidency. The following is adapted from the book.*

PRESIDENT GERALD R. FORD awoke early that Sunday, September 8, 1974, and took 8 a.m. Holy Communion at St. John's Episcopal Church, the "Church of the Presidents" across Lafayette Square from the White House. He prayed alone, asking, he said later, for "guidance and understanding," in pew 54, where every president since James Madison had worshiped. As he was leaving, reporters asked what he was doing for the rest of that day. "You'll find out soon enough," Ford said.

Back at the White House, he read over his speech—twice. "It is common knowledge that serious allegations and accusations hang like a sword over our former president's head," his speechwriter and top assistant, Robert Hartmann, had written. With a felt-tip marker, Ford inserted *"threatening his health as he tries to reshape his life, a great part of which was spent in the service of this country and the mandate of its people."* Morning sun slanted through the bullet-proof windows along the Rose Garden. Just before ten—about an hour before he was to go in front of the TV cameras—Ford phoned the leaders of Congress to tell them what he was about to do.

JUST 11 MONTHS BEFORE, Ford had decided to quit politics. He was House minority leader then—a likable legislative blocker and Republican Party workhorse—but he foresaw no hope in the reasonably near future of winning a majority that would elect him Speaker. Then Vice President Spiro T. Agnew was forced to resign after pleading no contest to bribery and tax-evasion charges. Congressional Democrats assured President Richard M. Nixon that no one but Ford could win confirmation, so he became vice president. And then the Watergate scandal metastasized, and Nixon resigned.

Thirty days before Ford took his place in the pew where James Madison had worshiped, he had become the only man in history to serve as president without having been elected to national office.

From the first, he faced a nation torn apart after a decade of Vietnam and more than two years of Watergate. With midterm elections less than three months away, and menaced by an angry snarl of problems—inflation, recession, a world energy crisis and a quickening threat of war in the Middle East—Ford's first priority was to bring his countrymen together. An accounting of events leading to his decision to pardon Nixon, based on documents and interviews with some of the surviving participants, suggests how monumentally difficult that would be.

After taking the oath of office on August 9 and asking the American people to "confirm me as president with your prayers," Ford had hit the White House hallways running, meeting with the White House staff, issuing marching orders to the White House economists, taking a round of am-

At his first press conference as president, August 28, 1974, Ford told reporters that he had "asked for prayers for guidance" about Nixon's judicial fate. As for a pardon, Ford said he had not ruled it out. "It is an option and a proper option for any president," he said. Eleven days later Ford would go on television to announce that he would indeed pardon the former president.

ASSOCIATED PRESS

bassadorial calls. His newly appointed press secretary, Jerry terHorst, held his first briefing for reporters.

Washington was in a fever of tips, leaks, confabulations and rumors: that Nixon had pardoned himself and all his aides before leaving; that he had spirited the rest of the White House tapes with him to his estate in San Clemente, California. TerHorst told the press he'd been advised that Nixon hadn't issued any pardons, to himself or anyone else.

A reporter asked if Ford would consider issuing a pardon himself.

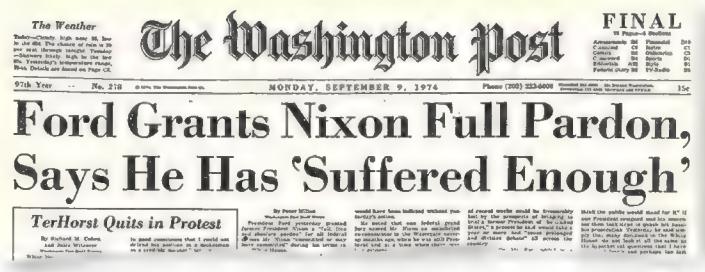
Ford had been asked the same question at his vice presidential confirmation hearing in the Senate. "I don't think the American people would stand for it," he had answered.

Without checking, terHorst said Ford still opposed granting Nixon immunity from prosecution.

"He is not in favor of immunity?" the reporter asked again.

"I can assure you of that," terHorst repeated.

But that question would hang over the Ford presidency for the next month, amplified by a host of Washington powers who had crucial and competing interests in how it would be answered. The Democratic-controlled Congress looked not only toward the midterm elections of 1974 but also toward the presidential election of 1976—and toward an electorate that seemed deeply divided on the question of Nixon's rightful legal fate. The Watergate special prosecutor, Leon Jaworski, agonized over the legal and moral consequences for Nixon, and for the coming trial of Watergate conspirators including H. R. "Bob" Haldemann, John Ehrlichman and John Mitchell, three of Nixon's closest aides. The holdover White House chief of staff, Alexander M. Haig, had brokered Nixon's resignation but did not consider the matter closed at that.


The Washington Post

FINAL

MONDAY, SEPTEMBER 9, 1974

Ford Grants Nixon Full Pardon, Says He Has 'Suffered Enough'

TerHorst Quits in Protest

In fact, just eight days before the resignation, while still serving Nixon, Haig had urgently visited Ford at his office in the Executive Office Building to tell him that the president planned to step down, and he had presented Ford a handwritten list, prepared by Nixon's special Watergate counsel, Fred Buzhardt, of "permutations for the option of resignation"—ways that Nixon could relinquish the presidency yet avoid indictment. One of them was that, as Ford put it, "Nixon could agree to leave in return for an agreement that the new president—Gerald Ford—would pardon him."

Outraged that Ford hadn't thrown Haig out of his office—there was no way a Ford administration would survive the idea that he had ascended to the presidency as part of a deal—Hartmann and Ford aide Jack Marsh had insisted that Ford phone Haig the next morning to state unambiguously, for the record, and in front of witnesses, that Ford had made no commitments of any kind.

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But the question of Nixon's legal status would not go away. And despite all the parties who had a stake in the outcome, Gerald R. Ford ultimately arrived at the answer very much on his own.

FORD WAS DETERMINED to put Watergate in the past, but he was forced into the fray on his second day in office.

Nixon, like every president before him, had laid claim to all his White House tapes and files—950 reels and 46 million pieces of paper. Lawyers in the special prosecutor's office—and defense attorneys in the Watergate coverup trial—believed that those records had to be available to them. After a Ford adviser discovered that some files had already been shipped to Nixon's California estate, the new president ordered that the remainder be kept in White House custody until their legal status could be sorted out.

From there, Watergate entanglements multiplied. Ford, despite his solid support for the Vietnam War, believed that the approximately 50,000 draft resisters and deserters who had left the country were also war victims. On August 19, in a Chicago speech before the Veterans of Foreign Wars (VFW), he proposed a program of "earned re-entry" to bring them home. While the VFW conventioneers greeted the announcement with stony silence, draft exiles in Canada—and, soon enough, others—voiced their suspicion that it was intended as a trade-off for a Nixon pardon.

Three days later, the House Judiciary Committee released its final report on Nixon's impeachment. The 528-page document stated unanimously that there was "clear and convincing evidence" that the former president had "condoned, encouraged . . . directed, coached and personally helped to fabricate perjury" and had abused his power, and should have been removed from office had he not resigned. The House approved the report by a vote of 412 to 3.

Philip Lacovara, Jaworski's counselor in the special prosecutor's office—a Goldwater conservative in a regiment of liberals—was adamant that his boss could not forgo a prosecution, but arguments for a pardon were being made.

Ford's nominee for vice president, Nelson Rockefeller, proclaimed that Nixon had suffered enough, and Nixon lawyer Herbert "Jack" Miller argued that his client could not receive a fair trial in the United States. In a memo to Ford, Nixon's old friend Leonard Garment, still the White House counsel, suggested that Nixon's mental and physical condition couldn't withstand the continued threat of criminal prosecutions and implied that, unless Nixon was pardoned, he might commit suicide. "For it to continue would be to treat him like a geek—a freak show," Garment said. "It was an awful thing to contemplate."

THE WASHINGTON POST

October 12, 1973: Nixon nominates House Minority Leader Gerald Ford as vice president, following the resignation of Spiro T. Agnew. Within months, Ford would struggle with how to serve Nixon loyally without being destroyed himself.

BETTMANN / CORBIS

Garment stayed up through the night to write his memo, delivering it on Wednesday, August 28. Unless Ford acted, he wrote, "The national mood of conciliation will diminish; pressure from different sources . . . will accumulate; the political costs of intervention will become, or in any event seem, prohibitive; and the whole miserable tragedy will be played out to God knows what ugly and wounding conclusion."

Garment urged that Ford announce a pardon at a news conference scheduled for that afternoon.

AT 2:30 P.M. THAT DAY, all three networks interrupted their broadcasts to carry Ford's news conference live from the packed East Room. Entering briskly, eyes ahead, Ford strode to the lectern, appearing relaxed and comfortable.

"At the outset," he said, "I have a very important and very serious announcement." Absent any prepared text, it was hard to know where he was headed.

"There was a little confusion about the date of this press conference. My wife, Betty, had scheduled her press conference for the same day. Obviously, I had scheduled my press conference for this occasion. So, Betty's was postponed."

Ford's eyes scanned the room. "We worked this out in a calm and orderly way," he said, leaning into his punch line. "She will postpone her press conference until next week, and until then I will be making my own breakfast, my own lunch and my own dinner."

There was light laughter, and then Ford called on Helen Thomas of UPI. "Mr. President," Thomas asked, "aside from the special prosecutor's role, do you agree with the [American] Bar Association that the law applies equally to all men, or do you agree with Governor Rockefeller that former President Nixon should have immunity from prosecution, and specifically, would you use your pardon authority, if necessary?"

"Well," Ford began, "let me say at the outset that I made a statement in this room in the few moments after the swearing-in, and on that occasion I said the following." Ford paused, looked down, shuffled through some cue cards, then read, slowly, "'that I hoped that our former president, who brought peace to millions, would find it for himself.'

"Now the expression made by Governor Rockefeller, I think, coincides with the general view and the point of view of the American people. I subscribe to that point of view. But let me add, in the last ten days or two weeks I have asked for prayers for guidance on this very important point.

"In this situation," Ford declared, "I am the final authority. There have been no charges made, there has been no action by the courts, there has been no action by any jury,

and until any legal process has been taken, I think it is unwise and untimely for me to make any commitment."

"May I just follow up on Helen's question?" someone asked from the back. "Are you saying, sir, that the option of a pardon for former President Nixon is still an option that you will consider, depending on what the courts do?"

"Of course, I make the final decision," Ford said. "And until it gets to me, I make no commitment one way or the other. But I do have the right as president of the United States to make that decision."

"And you are not ruling it out?"

"I am not ruling it out. It is an option and a proper option for any president."

Several voices rose at once. Ford had created an opening, and the reporters, accustomed to doing battle with Nixon, blitzed. Scanning the expectant faces, the president found Tom Jarrell of ABC.

"Do you feel that the special prosecutor can in good conscience pursue cases against former top Nixon aides as long as there is the possibility that the former president may not also be pursued in the courts?" Jarrell asked.

"I think the special prosecutor, Mr. Jaworski, has an obligation to take whatever action he sees fit in conformity with his oath of office, and that should include any and all individuals."

Nixon usually answered about 15 questions at his news conferences. After taking 29, Ford charged back to the Oval Office, seething. Although only eight of the questions had referred to Nixon, and the network summaries had emphasized Ford's statements on the economy, Ford felt besieged, and angry with himself for the confusion he knew his answers would cause. "God damn it," he recalled telling himself, "I am not going to put up with this. Every press conference from now on, regardless of the ground rules, will degenerate into a Q&A on, 'Am I going to pardon Mr. Nixon?'

"It would come after he was indicted, which he was going to be," he recalled thinking. "It would come after he was convicted, which he was going to be. It would come after his appeals, probably up to the Supreme Court. It was going to be a never-ending process. I said to myself, 'There must be a way for me to get my attention focused on the major problems before us.'"

By declaring first that he had "asked for prayers for guidance" and then that he wouldn't intervene "until the matter reaches me"—implying he might have to wait until just minutes before Nixon went to prison—Ford had staked out positions utterly at odds with each other. Yet he didn't know any way to avoid it. For him to say Jaworski shouldn't do his duty would be illegal and would undermine the entire Watergate prosecution. How, he wondered as he huddled with his top advisers, could he and the country not be incrementally swallowed by his dilemma?

Ford groped his way toward a firm decision, fighting, as Hartmann wrote, "for a little more time." He delegated someone to research, in secrecy, the scope of his pardon authority.

Soon after Jaworski arrived at work the next day, August 29, Lacovara handed him a confidential memorandum saying the president had placed Jaworski in "an intolerable position." By declaring that he reserved the right to pardon Nixon, yet also citing the special prosecutor's "obligation to take whatever action he sees fit," Ford had forced Jaworski's hand, telling him to make up his mind about—and take the heat for—indicting Nixon. From Lacovara's point of view, Jaworski needed to retaliate in kind.

Lacovara thought that the longer Ford waited to clarify his position, the greater the risk to the government's case against the six defendants in the coverup trial, which was scheduled to start in less than five weeks. "So I said in my memo, if President Ford is seriously considering pardoning President Nixon in order to spare him from criminal prosecution, he ought to make the decision now, as early as possible, before there's an indictment, and before we got onto the eve of trial," he says.

After considering his memo, Lacovara says, Jaworski "went to Haig and said, 'Not only am I getting pressure to indict, but I'm also getting pressure from my senior staff to have the president—President Ford—fish or cut bait. . . . The president needs to know that this is a call that he's ultimately going to have to make.'"

THE NEXT DAY, AUGUST 30, Ford entered the Oval Office and brought in Haig, who sat down across from him. Joining them soon were Hartmann, Marsh and Philip Buchen, Ford's former law partner in Michigan and one of his most trusted counselors. Ford tamped and lit his pipe thoughtfully. "I'm very much inclined," he announced, "to grant Nixon immunity from further prosecution."

No one spoke.

"Phil, you tell me whether I can do it and how I can do it," he told Buchen. "Research it as thoroughly and as fast as you can, but be discreet. I want no leaks." Ford blamed himself for not having studied the issue more thoroughly before the press conference, and he believed his contradictory answers resulted mainly from his not understanding fully his role and authority. Buchen, having handled sensitive matters for Ford for more than 30 years, understood he wasn't being asked his opinion. "It was my job to go find out *how* he could do it, rather than *whether* he should do it," he recalled.

Ford swore them all to secrecy, emphasizing that he had not made up his mind. He listed the reasons in favor of granting a pardon: the "degrading spectacle of a former President . . . in the prisoner's dock"; the pretrial publicity; the press stories that would resurrect "the whole rotten mess of Watergate"; ultimately the possibility that Nixon might be acquitted, or, if he were found guilty, that strong public opinion would arise to keep him out of jail.

None of the group disagreed.

Hartmann challenged Ford's timing—before Ford had a clear chance to establish himself in office. "What everybody believes is that you may pardon Nixon one day," he

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August 9, 1974: Nixon departs the White House en route to San Clemente, California, and exile. "You'll see so many of these red carpets," Patricia Nixon (in pink) told Betty Ford, "and you'll get so you hate 'em."

warned, "but *not* right away, and not until there have been further legal steps in the case.

"And if you do," Hartmann said, "the professional Nixon haters in the press and in the Congress will go right up the wall. You're going to face a firestorm of angry protest."

Ford acknowledged that there would be criticism but predicted he could survive it. "It'll flare up and die down," he said. "If I wait six months, or a year, there will still be a 'firestorm' from the Nixon haters. . . . But most Americans will understand."

Hartmann thought sympathy for Nixon would build the longer he was out of office. "It's already begun," he told Ford. "*Newsweek* says 55 percent of the people think further prosecution should be dropped." Why not wait, he suggested.

"If eventually," Ford asked, "why not now?"

Buchen, too, asked if this were the right time.

"Will there *ever* be a right time?" Ford replied.

AT FORD'S DIRECTION, attorney Benton Becker studied law books all through that Labor Day weekend, immersed unnoticed at the Supreme Court library. One 1915 ruling in particular impressed him.

The opinion in *Burdick v. United States* answered, in effect, a query Ford had posed: What does a presidential pardon *mean*? *New York Tribune* city editor George Burdick had declined to answer some questions before a federal grand jury about stories he had published—even though President Woodrow Wilson had issued him a blanket pardon for all offenses Burdick "has committed, or may have committed, or taken part in" regarding not only the published articles, but any others the grand jury might ask about. Burdick had refused the pardon because he believed accepting it would constitute an admission of a crime. The Supreme Court agreed, clarifying that a pardon "carries an imputation of guilt; acceptance a confession of it."

Becker believed that he had found in *Burdick* a rationale for pardoning Richard Nixon that would keep Nixon from being prosecuted yet also carry an admission of guilt, and he began to warm to the idea as a solution to Ford's dilemma. A pardon, unlike amnesty, instructed only that an individual would not be punished. Becker doubted Nixon would do anything that looked as if he were confessing—Haig had said Nixon would never confess or relinquish his claim to his records—but he thought Ford, by offering Nixon a pardon, could place the burden squarely on Nixon to accept or reject it.

The Tuesday following Labor Day, Becker presented his findings to Ford and Buchen in the Oval Office. Ford's power to pardon Nixon—at any time—of crimes he might

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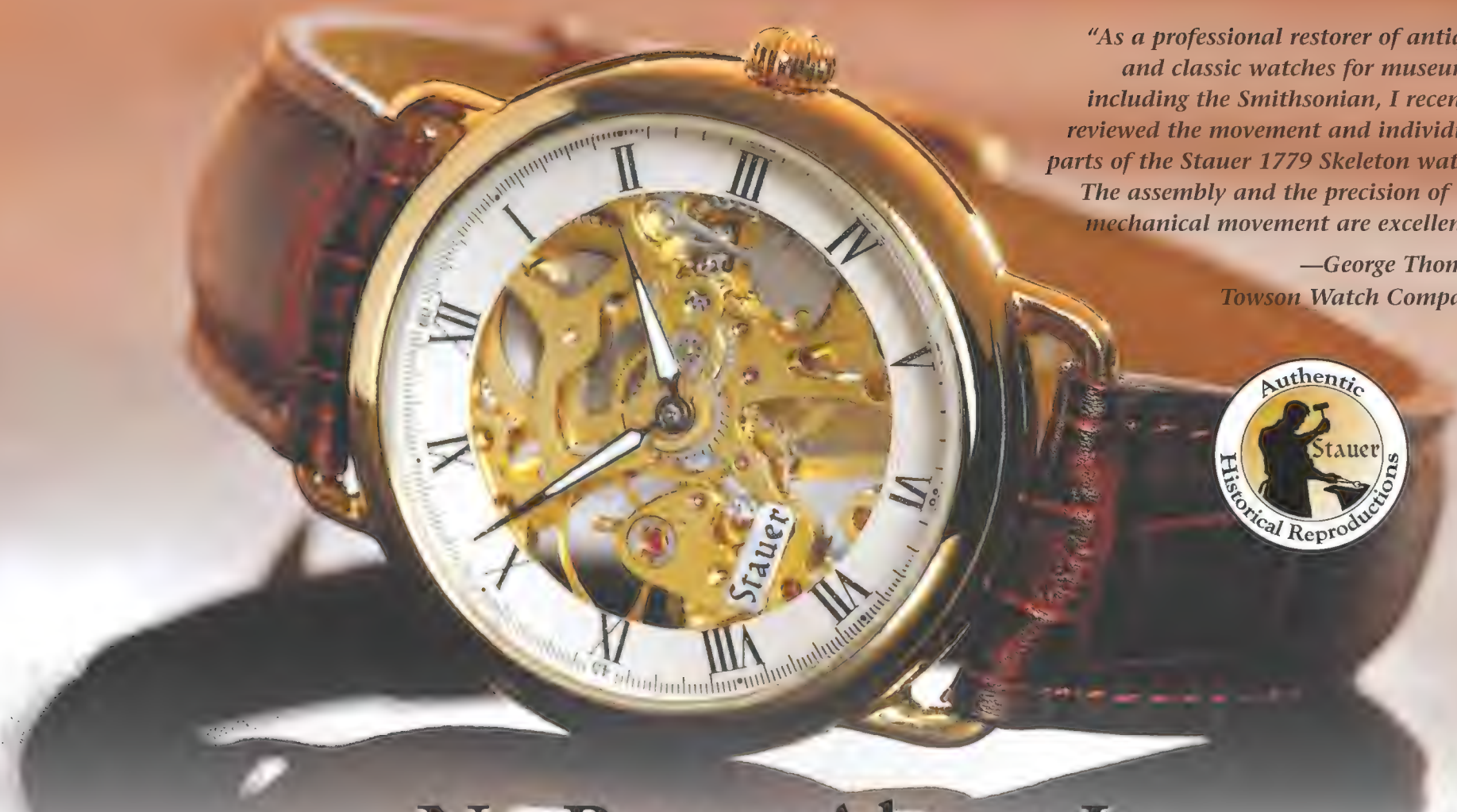

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The open exhibition back allows you to further explore the intricate movement and fine craftsmanship.

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have committed provided a whip hand that strengthened his resolve and his conviction that the country, despite a new Gallup poll that found 56 percent of Americans in favor of prosecuting Nixon, would support him.

"Look," Buchen said. "If you're going to do this to put Watergate behind you, I think you also ought to let me see how far we can go to get an agreement on the papers and tapes and have that in place at the same time." The attorney general had upheld Nixon's claim to his records; by linking a pardon to the fate of Nixon's materials, Buchen hoped to rescue Ford's leverage.

"Well," Ford said, "if you can get the papers and tapes question settled prior to the pardon, that's fine. Let's get it behind us. But I don't want to condition the pardon on his making an agreement on the papers and tapes, and I don't want you to insist on any particular terms."

With Ford resolved to move quickly ahead, Buchen had to conduct, in utmost secrecy, a three-way negotiation in which he would be discussing two momentous issues—clemency for a former president and the fate of Nixon's records, papers and tapes—with both the special prosecutor and Nixon's lawyer. Jaworski gave no indication he would oppose a pardon. Miller and Nixon agreed to yield a degree of control over Nixon's records to the federal government. It took days to hammer out a statement in which Nixon would accept blame, but by Saturday, September 7, Ford had what he needed. "Once I determine to move," he wrote, "I seldom, if ever, fret."

AS HE PHONED Congressional leaders on Sunday to notify them that he would pardon Nixon later that very morning, one after another of Ford's former colleagues, conservatives and liberals alike, expressed dismay, anger and confusion. In the end their objections shrank mostly to this: it was too soon. Nerves were shot. Ford's urgency seemed imprudent, willful, more a personal statement of his need to make Nixon go away than a judicious act of state. Or else there had been a deal—which would have been another crushing blow.

At 11:01 a.m., Ford faced the TV cameras. "Ladies and gentlemen," he read, his jaw set squarely, "I have come to a decision which I felt I should tell you and all my fellow American citizens as soon as I was certain in my own mind and in my own conscience that it is the right thing to do."

After much reflection and prayer, Ford said, he had come to understand that Nixon's "was an American tragedy in which we have all played a part." He acknowledged that there were no precedents for his action, and said he'd been advised by the special prosecutor's office that bringing Nixon to justice might take a year or more. "Ugly passions would again be aroused," Ford said heavily, "our people again would be polarized in their opinions, and the credibility of our free institutions of government would again be challenged at home and abroad."

Nixon and his family had "suffered enough, and will continue to suffer no matter what I do," Ford said. With that, he read a single-sentence proclamation granting "a full, free and absolute pardon unto Richard Nixon for all offenses against the United States which he . . . has committed or may have committed or taken part in" during his five and a half years as president. And with a looping left hand, Ford signed the document.

WITH THAT PEN STROKE, Gerald Ford spent almost all that he had gained simply by not being Richard Nixon—the bipartisan goodwill, the trust and affection of a divided nation that was willing to extend him the benefit of the doubt. Pardoning Nixon when he did, the way that he did, aborted the widespread hope—both shared and promoted by Ford, his team and most of the press—that his candor, decency and courage could clear up the wreckage of Watergate. "His action had quite the opposite effect from that which Ford intended," his biographer John Robert Greene wrote.

TerHorst, his press secretary, resigned in protest. Congress, freed of the necessity of further accommodation toward an unexpectedly popular leader, bolted. The Senate passed a resolution opposing any more Watergate pardons until the defendants had been tried, found guilty and exhausted all their appeals. The House passed two resolutions asking the White House to submit "full and complete information and facts" regarding how the decision was made. In addition to holding hostage Rockefeller's nomination as vice president, prolonging his confirmation until after the elections, Congress rebelled at the agreement for Nixon's tapes and records, perceiving it to be part of a bargain surrounding the pardon. Within months, it passed the Presidential Recordings and Materials Preservation Act of 1974, directing the National Archives to seize possession and control of Nixon's papers, records and tapes.

As Ford struggled to regain momentum throughout the fall, his clemency plan for Vietnam antiwar exiles fell flat. Less than one-fifth of those eligible signed up for the Vietnam Era Reconciliation Program, announced in mid-September.

On February 21, 1975, Mitchell, Haldemann and Ehrlichman were convicted on various charges of conspiracy, obstruction of justice and perjury and sentenced to two and a half to eight years in prison. A panel of circuit court judges denied their appeals, ruling that they had received a fair trial despite massive pretrial publicity.

After electoral defeats that fall, Republican conservatives began to criticize Ford openly. By late 1974, California governor Ronald Reagan stopped anguishing publicly about whether he should challenge a sitting president and began attacking Ford's policies in a weekly newspaper column. Ford's loss to Jimmy Carter in the 1976 presidential election set the stage for Reagan's victory four years later.

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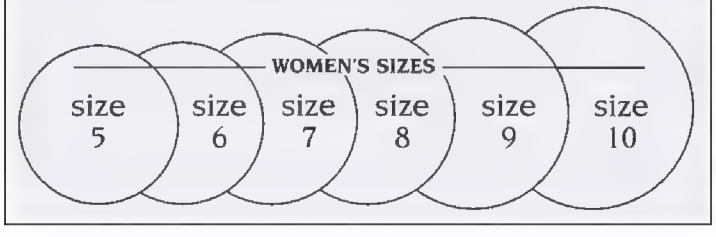

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THE VAN

ISHING

Little noticed by the outside world, perhaps the most dramatic decline of a wild animal in history has been taking place in India and Pakistan. Large vultures, vitally necessary and once numbering in the tens of millions, now face extinction. But why?

BY SUSAN McGRATH

THERE IS a moment during the capturing of baby vultures when the human nose can be considered an asset. In the Bandhavgarh Tiger Reserve of central India, this moment comes for us atop a 100-foot-high cliff etched with natural ledges and carved crenelations of an ancient Hindu fort built into the cliff's sandstone face. These high niches are prime nesting habitat for long-billed vultures, but this year only a few of the great birds have returned to nest, and chicks are few and far between. When a pungent, three-day-old diaper smell wafts up to us, we peer down, and there, on a ledge 30 feet below us, lies an eagle-size chick in a messy nest of twigs.

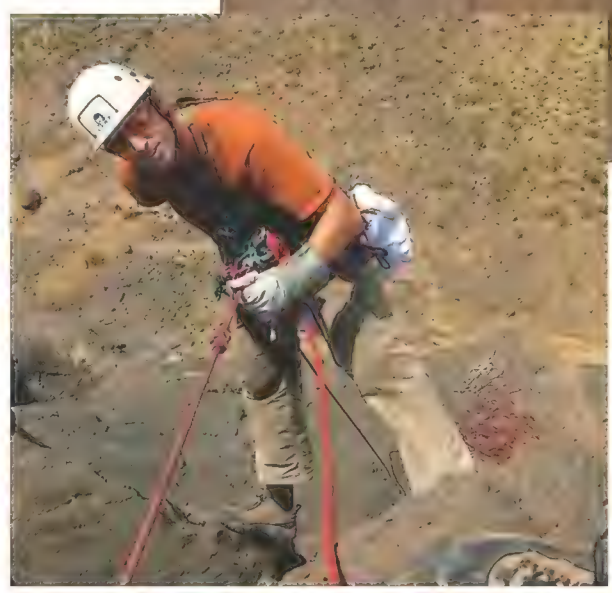
One of the nestling's enormous parents wheels into view. We see its full seven-foot wingspan, the tawny plumage on the adult's back rippling in the updraft, its darker wing feathers splayed at the tips. The bird banks hard and alights on the ledge. It nudges the chick, opens its long bill and urps up supper.

"Uh-oh. Bad timing," Richard Wesley says.

"Yep," says Richard Cuthbert. "You'll be seeing that meal again."

Cuthbert is a biologist with the United Kingdom's Royal Society for the Protection of Birds. Wesley is taking a busman's holiday from his job managing the New Zealand Alpine Club. The third member of this cliff-side team is a Bombay Natural History Society biologist named Shanmugam Saravanan.

Wesley clips a cloth bag to his rock-climbing harness and steps over the edge of the cliff. The adult bird dives away. Wesley drops 30 or so



India's once-ubiquitous large vultures are now scarce (a long-billed chick in the Bandhavgarh reserve, above). Scientists say capturing nestlings (Richard Cuthbert, left) for breeding (workers handle specimens, bottom and opposite) is the birds' only hope.

feet to the ledge, scoops the ungainly chick into the bag and climbs back. A wine-dark fluid seeps from the bag. At this point in vulture catching, the human nose can be considered a liability. "Vulture chicks vomit up the contents of their crops when they're stressed," Cuthbert says apologetically. "Thought to be a defense mechanism. Rather an effective one."

If the bag's stench of twice-regurgitated carrion reinforces one's stereotypes about the repugnance of vultures, the chick that emerges

RICHARD WESLEY (2); MARTIN WIGHTMAN; P.64,65 PALLAVA BAGLA; P.67 RICHARD CUTHBERT

from the bag dispels them. Up close, the baby is a beauty—the bare skin of its swan neck palest aqua, its pinfeathers a wild duck's browns.

The long-billed vulture, *Gyps indicus*, is one of three vulture species that serve as sanitation engineers in India, Nepal and Pakistan. For thousands of years, they have fed on livestock carcasses. As many as 40 million of the birds once inhabited the region. Obstreperous flocks of vultures thronged carcass dumps, nested on every tall tree and cliff ledge, and circled high overhead, seemingly omnipresent. In Delhi, perching vultures ornamented the tops of every ancient ruin. In Mumbai, vultures circled the Parsi community's hilltop sanctuary. Parsis, who are members of the Zoroastrian religion, lay their dead atop stone Towers of Silence so that vultures can devour the flesh. This practice, according to Parsi tradition, protects dead bodies from the defiling touch of earth, water or fire.

But across the subcontinent all three species of *Gyps* vultures are disappearing. Dead livestock lie uneaten and rotting. These carcasses are fueling a population boom in feral dogs and defeating the government's efforts to combat rabies. Vultures have become so rare that the Parsi in Mumbai have resorted to placing solar reflectors atop the Towers of Silence to hasten the decomposition of bodies. International conservation groups now advocate the capture of long-billed, white-backed and slender-billed vultures for conservation breeding.

That's why we're here. Cuthbert and Saravanan have permits to take eight long-billed vulture chicks from Bandhavgarh. (Young birds adapt more readily to captive conditions than adults, and once these birds can fly they're almost impossible to catch.) The recovery plan calls for a minimum of 25 pairs of each vulture species to be held in each of three breeding centers in northern India.

But these wild vultures are disappearing so fast—up to 99 percent of the population is now gone—that the captive-breeding goal is unlikely to be met. Many conservationists believe it's already too late for the *Gyps* vultures of the Indian subcontinent to survive in the wild.

It is an astonishing turn of events. "Just 15 years ago Indian *Gyps* vultures were thought to be the most numerous large raptors on the planet," Cuthbert says. "In a single decade they've undergone the most rapid population collapse of any animal in recorded history."

VILLAGERS IN NORTHERN INDIA were the first to notice. People started complaining about livestock carcasses lying around, rotting and attracting dogs. In 1996, in a town north of Delhi, Asad Rahmani, a wildlife biologist at Aligarh Muslim University, saw an item in the daily newspaper: "Where Are the Vultures?" the headline asked. That's odd, Rahmani thought. He checked the municipal carcass dump and found that there did seem to be fewer vultures.

India has more livestock than any country but China, "yet we are principally vegetarian," says Rahmani. "We keep cattle and buffalo primarily as dairy animals." Out in the countryside, when an animal dies, a skinner trundles it away in a pushcart, dumps it beside the road, flays it and leaves the carcass there. In urban areas, haulers take dead animals to official dumps. "It has always been the vultures' job to dispose of the flesh," Rahmani says.

Seattle-based **SUSAN MCGRATH**, *who wrote about cormorants in the February 2003 issue, specializes in environmental subjects.*

As many as 100 vultures may feed on a single cow carcass, stripping it clean in 30 minutes. Two thousand, 3,000, even 10,000 vultures swarmed the larger dumps in the early 1990s, the huge birds lapping at carcasses with their leathery tongues, thrusting their narrow heads neck-deep to reach internal organs, tussling over choice gobbets of meat. Year after year, Rahmani says, five million to ten million cow, camel and buffalo carcasses disappeared neatly down the gullets of India's vultures.

Rahmani, who became the director of the Bombay Natural History Society (BNHS) in 1997, organized the first of several meetings about the problem. Were biologists in other parts of India noticing a decline in vulture populations? Vibhu Prakash, a biologist with the BNHS, had documented a sharp drop. In a 1987 survey at Keoladeo National Park in the state of Rajasthan, Prakash had counted 353 breeding pairs of the white-backed vulture, *Gyps bengalensis*. Following up nine years later, Prakash found just 150 pairs. The next year there were only 25. By 1999 the Keoladeo vultures were gone.

Prakash couldn't tell what was killing them. The problem certainly wasn't a shortage of food—there were thousands of livestock carcasses at a dump in Rajasthan. Nor was it habitat degradation: prime nesting trees were still standing. Though pesticides were being used in agricultural areas, scientists thought the chemicals an unlikely culprit. "Birds that feed on other birds and on fish accumulate pesticides," Prakash says. "Birds that feed on mammals usually don't." Nevertheless, the researchers couldn't rule out the chemicals.

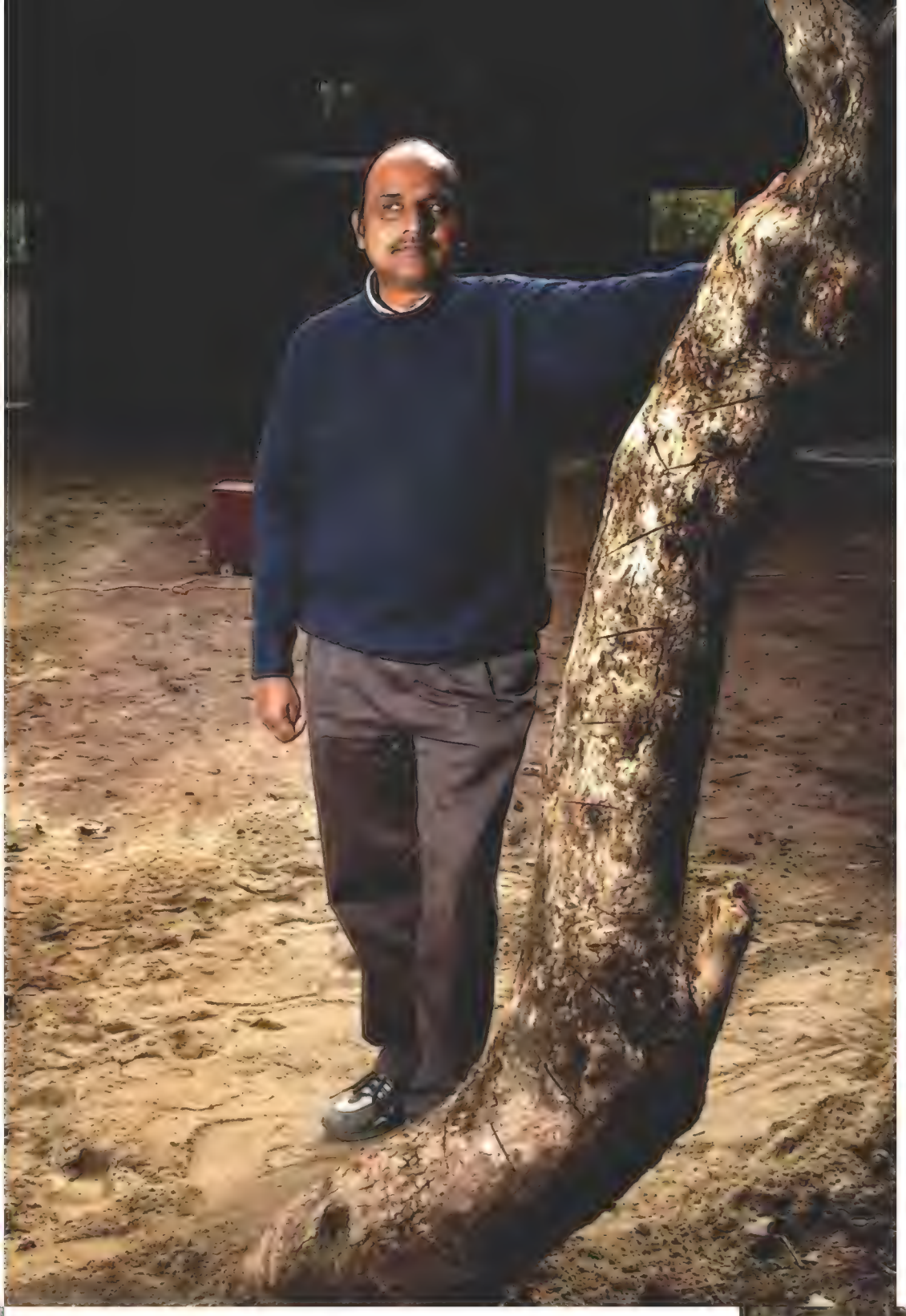
Pathologists could test for pesticide residues in dead birds—if suitable ones could be found. But in a place where daytime temperatures routinely exceed 100 degrees, fresh carcasses were hard to come by. Many of the birds died as they perched high in trees, and their carcasses, entangled among the branches, decayed where they hung. Those that ended up on the ground were dispatched by dogs, jackals and other scavengers. Prakash eventually found two vulture carcasses worth testing. One bird had keeled over as Prakash was observing it through binoculars, and he raced to find its carcass before the dogs did. The second had nested for years in the garden of an American living in Delhi. She had read about how rare the birds had become, and when she found one dead on her lawn, she phoned the BNHS.

Prakash rushed the two fresh carcasses to Haryana Agricultural University in the northwest Indian city of Hisar. A pathologist slit them open—and almost dropped his scalpel. The internal organs were covered by a whitish paste of uric acid crystals, a condition called visceral gout. The birds' kidneys had failed. But why?

Viruses can cause kidney failure. And the epidemiology of the mysterious die-off suggested an infectious disease caused by a virus or bacterium. "Vultures feed in groups, they nest in flocks, and they fly long distances," Prakash says, all behaviors that facilitate the transmission of disease. Also, the malady appeared to be spreading into Pakistan and Nepal. There are eight *Gyps* vulture species in Asia, Africa and Europe, with overlapping ranges. The virus, if that's what it was, had already killed more than 90 percent of India's vultures. It could kill Europe's and Africa's vultures as well.

IN EARLY 2000, BNHS, the Royal Society for the Protection of Birds (RSPB) and the U.S. Fish and Wildlife Department, which had funded Prakash's surveys, collaborated with the Zoological Society of London and the Idaho-based Peregrine Fund to help determine what was killing the vultures. The agency scientists knew they would have to find more carcasses and run sophisticated virology, bacteriology and toxicology tests on them.

But there was a snag. India strictly limits foreign researchers' use of indigenous biological materials. In the 1980s and '90s, foreign corporations prospecting in India had patented basmati rice, turmeric, black pepper extract, and the chemical in the neem tree used for cleaning teeth and controlling crop pests; as a result, Indians watched foreign corporations earn royalties on products from plants that Indians considered part of their natural heritage. In



Eurasian griffon vultures (opposite, in Rajasthan) are taking over where other vulture species dominated, but they are vulnerable to the same scourge. Vibhu Prakash (above, at a captive-breeding center near Pinjore) was one of the first biologists to draw attention to the vulture population crash. It has been a boon to wild dogs (right)—and human disease, spurring India's rabies rate, the world's highest.

them to the lab of a Washington State University microbiologist, Lindsay Oaks; a partner, the Ornithological Society of Pakistan, which helped furnish permits; and three still healthy, wild breeding colonies with a total of 2,500 pairs of white-backed vultures.

The only thing Virani and Oaks couldn't seem to find was fresh vulture carcasses. "Thirty million dead vultures, you'd think we could find at least one," Oaks says. Three weeks' searching yielded only four dead birds. Back at Washington State, Oaks found visceral gout in these carcasses, but after running scores of tests, the scientists found nothing to explain what had caused the condition. Political upheaval in Pakistan in the wake of the September 11, 2001, terrorist attacks kept Virani and Martin Gilbert, a Scottish veterinarian, from returning to Multan later that year. Instead, Muhammad Asim, an accountant for the Ornithological Society of Pakistan, took over the carcass hunt. His team of university students, carrying coolers of dry ice, searched at night and early in the morning to find carcasses not yet fried by the sun. Oaks tested the dozen carcasses they found for infectious viruses and bacteria, heavy metal poisoning, pesticides and nutritional deficiencies. But all he found was gout. The next year they continued the search; that season's carcasses, too, showed signs only of gout. "Well, I can tell you what they're *not* dying of," Oaks groused to Virani in early 2003. Yet by then an estimated 90 percent of Pakistan's *Gyps* vultures and 95 percent of India's had died.

Oaks, Gilbert and Virani then began to focus on another idea. "The food source for these birds is almost all domestic livestock," Oaks says. "We knew it all along but it hadn't clicked. And the one thing we hadn't looked at was what goes into livestock."

response, the government passed laws controlling access to genetic material and restricting the shipping of biological samples abroad. In order to get permits to export tissue samples for analysis, the vulture researchers would have to prove that the work couldn't be done in India. Frustrated, Prakash, Rahmani and their British colleagues decided to build a pathology lab and vulture-care center in India.

The Peregrine Fund took a different approach. "Pakistan is right next door to India. It allows the export of tissue samples. So we set up shop there," says Munir Virani, a Peregrine Fund biologist. In Multan, in central Pakistan, Virani found everything he needed: an ultra-low temperature freezer for storing samples; a source of liquid nitrogen for shipping

THERE'S A LITTLE PHARMACY on almost every block of almost every town in South Asia, and Multan is no exception. "You can go in and say, 'My cow's not eating, what can I give

AMI VITALE (2) P.68 PALLAVA BAGLA

her?' and the pharmacist will root around under the counter and find something, and off you'll go with it," Oaks says.

Asim and his students tore around Multan, making a list of every drug and nutritional supplement sold for use in livestock—35 or 40 products. Which ones were cheap, potentially toxic to kidneys and new to the market? There was one, Oaks found—a nonsteroidal anti-inflammatory drug that had been used as a painkiller for decades in the West, but had only recently been licensed for veterinary use in India, Pakistan and Nepal: diclofenac.

Oaks checked his vulture samples. All 28 birds with gout now tested positive for diclofenac, and all 20 birds with no gout (killed by gunshot or other causes) tested negative. "That was a very strong association," Oaks says, sounding pleased with the understatement.

Reproducing the effects in live birds would help clinch the diagnosis. Though Pakistanis, most of whom are Muslim, do eat beef, they rarely eat buffalo and never eat donkey. The carcasses of the latter two are the primary food for Pakistan's vultures. An aged buffalo slated to become vulture food was dosed with diclofenac, slaughtered and fed to captive vultures. All the birds died within six days; their necropsies showed visceral gout.

Oaks and Virani received those results just as they arrived at a world conference on vultures in Budapest in May 2003. Euphoric, they presented their findings to the assembled experts. This is no virus, they said; the vultures of the Indian subcontinent are being poisoned by a pharmaceutical drug given to domestic livestock, whose carcasses are subsequently consumed by vultures.

But "How?" asked members of a stunned and skeptical conference audience. How could a prescription pharmaceutical drug reach tens of millions of vultures across nearly two million square miles of South Asia? Many scientists and conservationists, along with journalists from around the world, remained unconvinced.

NITA SHAH, a wildlife biologist at BNHS, has studied Indian ungulates for two decades. Nomadic herders carry a sophisticated pharmacopeia, Shah says, thanks to the availability in India of cheap drugs. A 1972 law allowing Indian companies to reverse-engineer patented drugs spawned a gargantuan pharmaceutical industry. And though India superseded that law in 2005 with one that upholds international patents, some 20,000 pharmaceutical companies duke it out for market share in the nation today, selling drugs for a fraction of what they cost in the West. In India, diclofenac is manufactured in veterinary doses by at least 40 companies.

Herders use diclofenac to treat pain, inflammation and fever in their animals. "Western India especially is covered with invasive thorn bushes, which cause a lot of small injuries," Shah says. "And then maybe the animal can't keep up with the group, or is more subject to predation. So a herder learns these tricks of the trade when his migration takes him near urban centers, and then knowledge of any new drug spreads by word of mouth."

Asim surveyed 84 pharmacies, clinics and village shops in the Punjab and Sindh and found veterinary diclofenac at all of them; 77 sold it daily. The drug is highly effective—it'll speed a cow's recovery from an inflamed udder so it can be milked the next day, or cool the heat in an ox's sore hip so it can pull a plow. Not all animals recover, of course. Some die within a day or two, regardless of treatment. Their skinned carcasses are left for vultures.

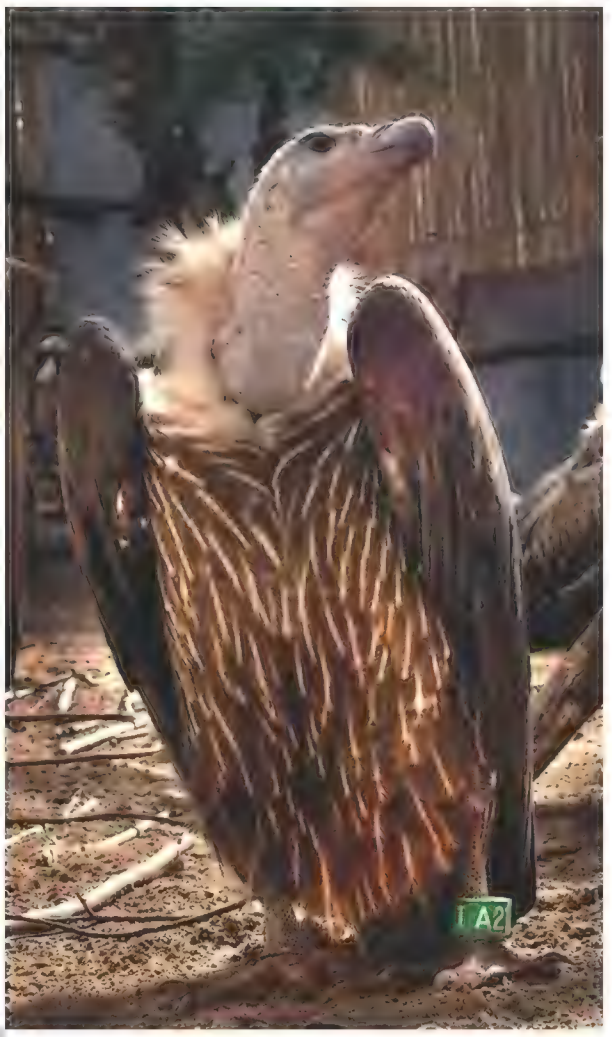
How many freshly dosed animals would have to die to account for 30 million or more dead vultures? Surprisingly few. A Cambridge zoologist calculated that only 0.1 to 0.8 percent of livestock carcasses would have to contain diclofenac to kill vultures at the rate observed. Prakash and Cuthbert collected tissue samples from almost 2,000 livestock carcasses across the Indian cowbelt. Almost 10 percent contained diclofenac.

With this last piece of data, BNHS and RSPB considered

For hundreds of years the Parsi people of Mumbai have left their dead on the Towers of Silence, to be consumed by vultures (below, c. 1955). Now the sacred practice is in peril. Rebuilding the vulture population from captives (right) will be difficult; chicks take five years to reach reproductive age.

the case closed. In February 2003, they converted the pathology lab and vulture-care center in Haryana to a long-term captive-breeding center.

In March 2005, Prime Minister Manmohan Singh of India directed that veterinary use of diclofenac be phased out within six months. Six months stretched to 14, but this past May, India's drug controller general directed pharmaceutical companies to halt production and sales of diclofenac within three months. Nepal banned the manufacture and importation of the drug in June 2006, and Pakistan did so in September. An alternative drug, meloxicam, is now being made by a dozen or so pharmaceutical companies. It appears to be harmless to vultures.



The ban will help, Cuthbert says, but vultures take five years to reach reproductive age, and lay only one egg per season. "Even if we got rid of all the [remaining] diclofenac tomorrow, the recovery would take decades." Meanwhile, cow carcasses are mounting up all over northern India. They are "a time bomb waiting to explode," Munir Virani says.

AT THE DUSTY RED WASTELAND that serves as the town carcass dump for Kota, in eastern Rajasthan, seven men flay a quartet of fresh cow carcasses. The men laugh and joke, and a festive atmosphere prevails despite the rotting meat, the sick-sweet stench of carrion and hair-raising shrieks and snarls from dogfights. Crows, mynas and Egyptian vultures pepper the grotesque windrows of bone.

It appears these smaller vultures are being poisoned too. Cuthbert and Prakash have recently documented significant declines in Egyptian and red-headed vultures. There's been no toxicity testing on them, nor has anyone surveyed the populations of steppe eagles, kites and other, smaller avian scavengers, but the scientists speculate that those birds are also being poisoned, now that the big *Gyps* vultures no longer elbow them away from livestock carcasses.

Diclofenac doesn't hurt the dogs. (No one knows yet why the drug kills birds but not mammals.) At the dump, 50 or 60 yellow-brown dogs tear at carcasses. Under every mesquite bush, sated dogs lie curled, asleep. "Yes, the dogs are many now that the long-necked vultures are gone," a skinner says. India doesn't cull dogs because of Hindu and Buddhist prohibitions on taking life. In the past, starvation and disease kept dogs in check. With vultures so vastly reduced in number, dogs have more than enough to eat; their population increased from 22 million in 1992 to 29 million in 2003, the last year for which figures are available. India's official human death toll from rabies is the world's highest—30,000 deaths annually, two-thirds of them caused by dog bites. In recent years, the government has made rabies vaccines more widely available in rural areas, but rabies deaths aren't decreasing at the rate they should be because the unvaccinated dog population is growing, according to rabies experts.

Public health officials say it's likely that India's rat population is growing too, sharing the bounty of abandoned carcasses with feral dogs, and raising the probability of outbreaks of bubonic plague and other rodent-transmitted human diseases. Livestock diseases may increase too. Vultures are resistant to anthrax, brucellosis and other livestock diseases, and helped control them by consuming contaminated flesh, thus removing reservoirs of infectious organisms. Some municipalities are now resorting to burying or burning carcasses, expending precious land, firewood and fossil fuels to replace what Rahmani calls "the beautiful system nature gave us."

TIME IS NOT on the researchers' side as they race to capture vulture chicks before the birds die in the nest, poisoned by contaminated carrion. The odds of any young vulture living to breeding age in the wild is almost zero. The team has plucked its quota of eight long-billed vultures from the Bandhavgarh cliffs in three days, and Saravanan has hurried the birds off to the breeding center in Pinjore, north of Delhi. When I ask Cuthbert what the likelihood is that the breeding program will achieve its goal of capturing 450 vultures, he shakes his head and turns away.

Compared with long-billed vultures, white-backed vultures are more widely dispersed and harder to find—they nest in trees rather than cliffs, so the remnants of their population could be almost anywhere. On a sweltering afternoon our jeep heads out of Bandhavgarh National Park's far gate. Soon the odor of rotting diapers envelops the jeep. We all shout to the driver to stop, and he jams on the brakes. We leap out and trace the familiar stench down a bank to a copse of tall trees. But there is no vulture nest. Just a rotting cow carcass, unattended.

Hours later, thanks to a sharp-eyed local forest warden, we do find a nest—a haystack of twigs in a tall tree. Cuthbert and Wesley toss a line over a branch, jousting amicably over who gets to climb. A chick makes the question moot when it flaps nonchalantly over to join its parents on a neighboring tree. This chick has fledged; they'll never catch it now. We watch the youngster in silence. It has escaped capture and a life of tedium in a breeding center—and fled to certain death.

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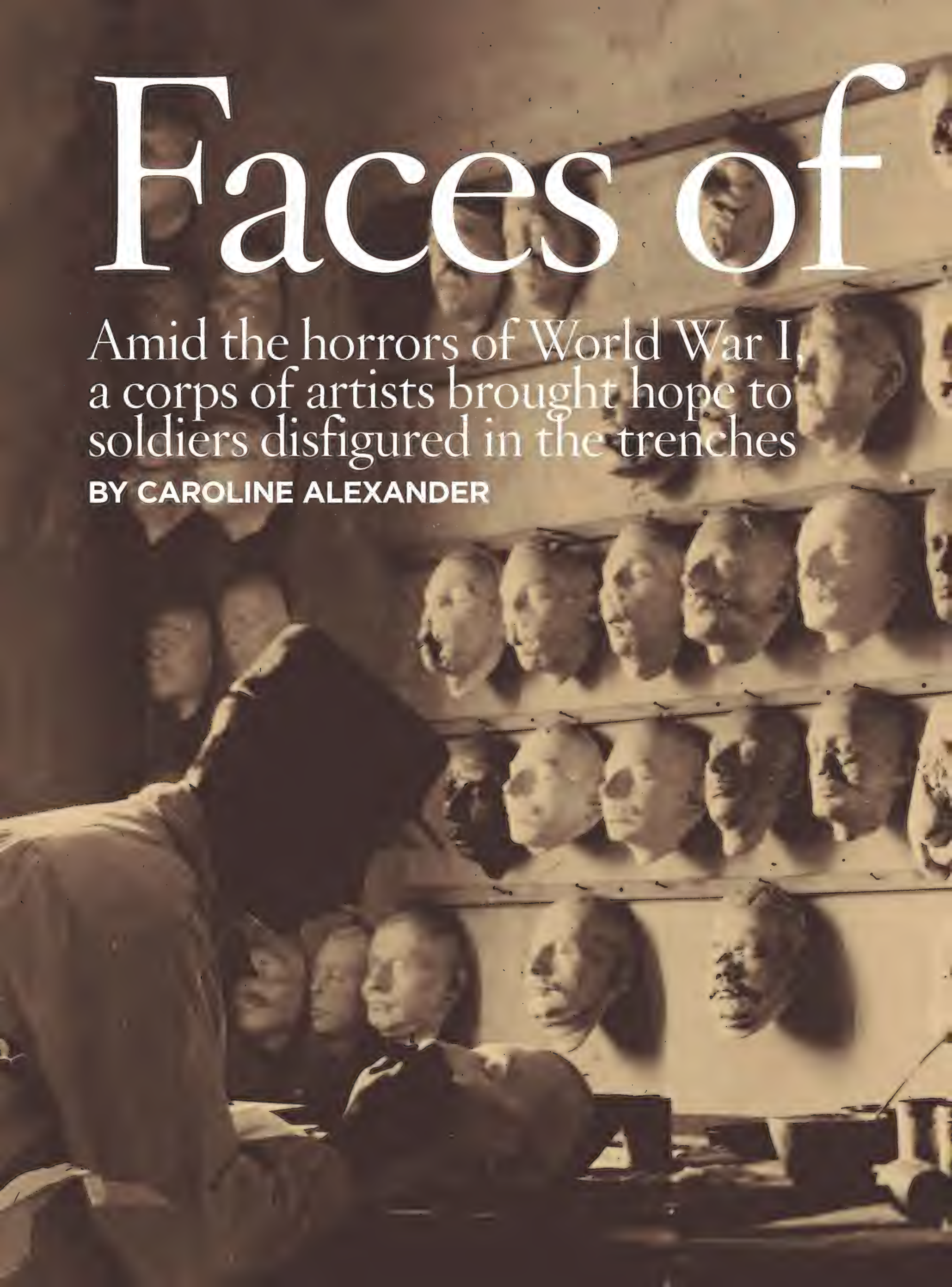
AMI VITALE; P.70 ALICE SCHALEK / HULTON ARCHIVE / GETTY IMAGES

Faces of

Amid the horrors of World War I, a corps of artists brought hope to soldiers disfigured in the trenches

BY CAROLINE ALEXANDER



War

WOUNDED TOMMIES facetiously called it "The Tin Noses Shop." Located within the 3rd London General Hospital, its proper name was the "Masks for Facial Disfigurement Department"; either way, it represented one of the many acts of desperate improvisation borne of the Great War, which had overwhelmed all conventional strategies for dealing with trauma to body, mind and soul. On every front—political, economic, technological, social, spiritual—World War I was changing Europe forever, while claiming the lives of 8 million of her fighting men and wounding 21 million more.

The large-caliber guns of artillery warfare with their power to atomize bodies into unrecoverable fragments and the mangling, deadly fallout of shrapnel had made clear, at the war's outset, that mankind's military technology wildly outpaced its medical: "Every fracture in this war is a huge open wound," one American doctor reported, "with a not merely broken but shattered bone at the bottom of it." The very nature of trench warfare, moreover, proved diabolically conducive to facial injuries: "[T]he . . . soldiers failed to understand the menace of the machine gun," recalled Dr. Fred Albee, an American surgeon working in France. "They seemed to think they could pop their heads up over a trench and move quickly enough to dodge the hail of bullets."

Life in the trenches, wrote the British poet Siegfried Sassoon, "is audacious and invincible—until it is whirled away in enigmatic helplessness and ruin." Enemies popped up from the earth to shoot at each other, producing a bumper crop of head wounds.

Sculptor Anna Coleman Ladd (above right) perfected mask-making in her Paris studio. "We give the soldiers a warm welcome," Ladd wrote. With an unidentified assistant, she fits a French soldier with a paper-thin metal mask, secured by ear-pieces from spectacles and plated from a plaster mold of the man's face. Ladd made a point of befriending "those brave faceless ones."

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Writing in the 1950s, Sir Harold Gillies, a pioneer in the art of facial reconstruction and modern plastic surgery, recalled his war service: "Unlike the student of today, who is weaned on small scar excisions and graduates to harelips, we were suddenly asked to produce half a face." A New Zealander by birth, Gillies was 32 and working as a surgeon in London when the war began, but he left shortly afterward to serve in field ambulances in Belgium and France. In Paris, the opportunity to observe a celebrated facial surgeon at work, together with the field experience that had revealed the shocking physical toll of this new war, led to his determination to specialize in facial reconstruction. Plastic surgery, which aims to restore both function and form to deformities, was, at the war's outset, crudely practiced, with little real attention given to aesthetics. Gillies, working with artists who created likenesses and sculptures of what the men had looked like before their injuries, strove to restore, as much as possible, a mutilated man's original face. Kathleen Scott, a noted sculptress and the widow of Capt. Robert Falcon Scott of Antarctica fame, volunteered to help Gillies, declaring with characteristic aplomb that the "men without noses are very beautiful, like antique marbles."

While pioneering work in skin grafting had been done in Germany and the Soviet Union, it was Gillies who refined and then mass-produced critical techniques, many of which are still important to modern plastic surgery: on a single day in early July 1916, following the first engagement of the Battle of the Somme—a day for which the *London Times* casualty list covered not columns, but pages—Gillies and his colleagues were sent some 2,000 patients. The clinically honest before-and-after photographs published by Gillies shortly after the war in his landmark *Plastic Surgery of the Face* reveal how remarkably—at times almost unimaginably—successful he and his team could be; but the gallery of seamed and shattered faces, with their brave patchwork of missing parts, also demonstrates the surgeons' limitations. It was for those soldiers—too disfigured to qualify for before-and-after documentation—that the Masks for Facial Disfigurement Department had been established.

"My work begins where the work of the surgeon is completed," said Francis Derwent Wood, the program's founder. Born in England's Lake District in 1871, of an American father and British mother, Wood had been educated in Switzerland and Germany, as well as England. Following his family's return to England, he trained at various art institutes, cultivating a talent for sculpture he had exhibited as a youth. Too old for active duty when war broke out, he had enlisted, at age 44, as a private in the Royal Army Medical Corps. Upon being assigned as an orderly to the 3rd London General Hospital, he at first performed the usual "errand-boy-housewife" chores. Eventually, however, he took upon himself the task of devising sophisticated splints for patients, and the realization that his abilities as an artist could be medically useful inspired him to construct masks for the irreparably facially disfigured. His new metallic masks, lightweight and more permanent than the rubber prosthetics previously issued, were custom designed to bear the prewar portrait of each wearer. Within the surgical and convalescent wards, it was grimly accepted that facial disfigurement was the most traumatic of the multitude of horrific damages the war inflicted. "Always look a man straight in the face," one resolute nun told her nurses. "Remember he's watching your face to see how you're going to react."

WOOD ESTABLISHED his mask-making unit in March 1916, and by June 1917, his work had warranted an article in *The Lancet*, the British medical journal. "I endeavour by means of the skill I happen to possess as a sculptor to make a man's face as near as possible to what it looked like before he was wounded," Wood wrote. "My cases are generally extreme cases that plastic surgery has, perforce, had to abandon; but, as in plastic surgery, the psychological effect is the same. The patient acquires his old self-respect, self assurance, self-reliance, . . . takes once more to a pride in his personal appearance. His presence is no longer a source of melancholy to himself nor of sadness to his relatives and friends."

Toward the end of 1917, Wood's work was brought to the attention of a Boston-based American sculptor, inevitably described in articles about her as a "socialite." Born in Bryn Mawr, Pennsylvania, Anna Coleman Watts had been educated in Paris and Rome, where she began her sculptural studies. In 1905, at the age of 26, she had married Maynard Ladd, a physician in Boston, and it was here that she continued her work. Her sculptural subjects were mostly decorative fountains—nymphs abounding, sprites dancing—as well as portrait busts that, by today's tastes, appear characterless and bland: vaguely generic portraits of vague-

Sir Harold Gillies (top) improvised plastic surgery to patch up injured British soldiers. Artist Francis Derwent Wood (bottom) took on the "extreme cases that plastic surgery . . . had to abandon." Sculptor Anna Coleman Ladd (middle) adapted Wood's methods at her Studio for Portrait Masks in Paris.

GILLIES ARCHIVES, QUEEN MARY'S HOSPITAL, SIDCUP, UK; ANNA COLEMAN LADD PAPERS, ARCHIVES OF AMERICAN ART, SI; NATIONAL PORTRAIT GALLERY, LONDON

ANNA COLEMAN LADD PAPERS, ARCHIVES OF AMERICAN ART, SI (2); LIBRARY OF CONGRESS, PRINTS & PHOTOGRAPHS (2); ANNA COLEMAN LADD PAPERS, ARCHIVES OF AMERICAN ART, SI (4)

Portraits in Ladd's Paris workrooms documented the progress of patients who were the beneficiaries of new noses, jaws and eyes. Masks were painted on their wearers to precisely match skin color; some bristled with lifelike mustaches. Soldiers gained confidence to reenter society. "Thanks to you," one wrote to Ladd, "I will have a home. . . . The woman I love . . . will be my wife."

ly generic faces. The possibility of furthering the work by making masks for wounded soldiers in France might not have been broached to Ladd but for the fact that her husband had been appointed to direct the Children's Bureau of the American Red Cross in Toul and serve as its medical adviser in the dangerous French advance zones.

In late 1917, after consultation with Wood, now promoted to captain, Ladd opened the Studio for Portrait Masks in Paris, administered by the American Red Cross. "Mrs. Ladd is a little hard to handle as is so often the case with people of great talent," one colleague tactfully cautioned, but she seems to have run the studio with efficiency and verve. Situated in the city's Latin Quarter, it was described by an American visitor as "a large bright studio" on upper floors, reached by way of an "attractive courtyard overgrown with ivy and peopled with statues." Ladd and her four assistants had made a determined effort to create a cheery, welcoming space for her patients; the rooms were filled with flowers, the walls hung with "posters, French and American flags" and rows of plaster casts of masks in progress.

The journey that led a soldier from the field or trench to Wood's department, or Ladd's studio, was lengthy, disjointed and full of dread. For some, it began with a crash: "It sounded to me like some one had dropped a glass bottle into a porcelain bathtub," an American soldier recalled of the day in June 1918 on which a German bullet smashed into his skull in the Bois de Belleau. "A barrel of whitewash tipped over and it seemed that everything in the world turned white."

Stage by stage, from the mud of the trenches or field to first-aid station; to overstrained field hospital; to evacuation, whether to Paris, or, by way of a lurching passage across the Channel, to England, the wounded men were carried, jolted, shuffled and left unattended in long drafty corridors before coming to rest under the care of surgeons. Multiple operations inevitably followed. "He lay with his profile to me," wrote Enid Bagnold, a volunteer nurse (and later the author of *National Velvet*), of a badly wounded patient. "Only he has no profile, as we know a man's. Like an ape, he has only his bumpy forehead and his protruding lips—the nose, the left eye, gone."

CAROLINE ALEXANDER *is the author of* The Bounty: The True Story of the Mutiny on the Bounty.

Rivaling Nature?

In Iraq, as in past conflicts, combat technology outpaces medical technology. Protected by innovative body armor, soldiers sustain far fewer injuries to the torso, but limbs and heads remain terrifyingly vulnerable. "In World War I, Harold Gillies converted all the dentists overnight into plastic surgeons," says Dr. Joseph Rosen, a plastic surgeon at Dartmouth-Hitchcock Medical Center who works with soldiers injured in Iraq. "Now we're seeing an increased demand for limb and facial plastic surgeons."

Sophisticated frontline casualty care has saved the lives of many soldiers who would have died of similar injuries in previous conflicts. But survivors must now live with what is often massive damage. Improvised explosive devices (IEDs)—typically roadside bombs hidden on convoy routes—are to this war what artillery fire was to World War I; the explosive blast itself shears off body parts, while concussive force causes internal injuries and permanent brain damage. "We're used to thinking about losing an arm or an eye or an ear," Rosen says. "When you lose all these things simultaneously—the blast injuries take your arms with your face; that's what makes these polytrauma injuries—they're not the sum of their parts, they're much worse."

The severity of facial wounds is also greater. "We had a colleague here who trained under Gillies," Rosen recalls. "When I looked at his 25 cases of facial injuries from World War II and I look at the cases today, the cases today are of an order of magnitude substantially worse. Between World War I and World War II, the change wasn't that much, but in the change to this present war with the blast injuries, we shifted from high-energy transfer to *massive*-energy transfer."

Rosen envisions an ambitious timeline of possible treatment, with reconstruction through surgery representing the first stage, and regeneration of a missing body part through tissue engineering being the ultimate, futuristic goal. "That's more like the year 2050," Rosen allows. In between these options is transplantation—of a hand, a limb, a face. In November 2005, French surgeons pioneered a partial face transplant. More accurately characterized as a "soft tissue transplant," the operation is suitable only for those who have retained an underlying normal facial structure. "No one is yet proposing a full re-provision of the whole face including the underlying bony structures," cautions Dr. Andrew Bamji, curator of the Gillies Archives in Sidcup, England. Dazzling advances in medical and biotechnology notwithstanding, the choices offered facially damaged soldiers of the Iraq War remain essentially the choices of World War I: if reconstructive surgery cannot produce adequate results, the soldier may elect to wear prosthetic covering.

"Generally, they choose facial prostheses not so much as a mask, but because they want to wear glasses, or sunglasses, and they need a nose," says Erin Donaldson, a clinical anaplastologist for Living Skin, a company specializing in lifelike prostheses. Most of Donaldson's clients are civilians who have suffered burns, or facial cancer, or were born with congenital defects. But she has also worked with soldiers disfigured in earlier wars. Prostheses typically substitute for a single part, such as a nose, or a portion of a face, rather than affording full-face coverage. "Most of our patients find out about facial prosthetics on the Internet," she says. Some of her patients had previously worn dust masks colored with cosmetic foundation.

Advanced artificial skin technology, in particular, has allowed amazingly realistic creations; of one client's new nose Donaldson says, "It looked ridiculously good—you really couldn't tell." But despite such advances, wearers of prosthetic faces confront many of the same drawbacks today as in World War I. Breath moisture creates problems, steaming up glasses and interfering with adhesives; and even the most sophisticated prosthesis does not move. "If it's an eye, it can't blink," Donaldson says, "but it does protect your anonymity. It's not for your friends and family, it's not to fool people close to you. It's for the split second when you cross paths with someone in a grocery store."

Facial prostheses that can make lifelike, expressive movements—smiles and frowns and all the nuanced expressions that flow across the human face—are the ambitious goal of robotics expert David Hanson. The founder and CEO of Hanson Robotics, he has won acclaim for his cutting-edge, human-like robots and his invention of a substance closely resembling human skin. Called Frubber, from "facial rubber," the synthetic skin mimics the cell structure of the real thing and allows expressive movements to be battery powered by minimal energy.

"The first versions, you would have a robotic mask that would be removed, and washed and probably replaced every few years," Hanson speculates. Acknowledging that many people manifest deep-seated unease with robotic hardware that mimics humans too closely, he is confident that such technologies will eventually find acceptance. Hanson hopes to try out some types of facial prostheses on patients within the next year before beginning clinical trials. "We had a fairly careful analysis showing that it's feasible at least to have an animated eye and eye region, including an eyelid and eyebrow, within three years."

"My patients would probably try it, and then never wear it," says Donaldson of a full-face robotic mask. "What if it breaks? You're back to square one." Unless a patient is missing actual facial parts, Donaldson advocates confronting the world with the face that remains. "It's society that should change," she says. "It's the public that needs to be educated." —*C.A.*

Robotics may soon add movement to today's realistic prostheses, made with artificial skin (Erin Donaldson).

RICHARD HOWARD

Some soldiers came to a 1918 Christmas party in Ladd's Paris studio swaddled in bandages while others wore new faces. Festooned with flags, trophies and flowers, the place was designed to be cheerful. Mirrors were banned from some treatment centers to save patients from seeing their mangled faces. By the end of 1919, some 185 men would be wearing new Ladd Studio faces.

Those patients who could be successfully treated were, after lengthy convalescence, sent on their way; the less fortunate remained in hospitals and convalescent units nursing the broken faces with which they were unprepared to confront the world—or with which the world was unprepared to confront them. In Sidcup, England, the town that was home to Gillies' special facial hospital, some park benches were painted blue; a code that warned townspeople that any man sitting on one would be distressful to view. A more upsetting encounter, however, was often between the disfigured man and his own image. Mirrors were banned in most wards, and men who somehow managed an illicit peek had been known to collapse in shock. "The psychological effect on a man who must go through life, an object of horror to himself as well as to others, is beyond description," wrote Dr. Albee. ". . . It is a fairly common experience for the maladjusted person to feel like a stranger to his world. It must be unmitigated hell to feel like a stranger to yourself."

The pains taken by both Wood and Ladd to produce masks that bore the closest possible resemblance to the prewar soldier's uninjured face were enormous. In Ladd's studio, which was credited with better artistic results, a single mask required a month of close attention. Once the patient was wholly healed from both the original injury and the restorative operations, plaster casts were taken of his face, in itself a suffocating ordeal, from which clay or plasticine squeezes were made. "The squeeze, as it stands, is a literal portrait of the patient, with his eyeless socket, his cheek partly gone, the bridge of the nose missing, and also with his good eye and a portion of his good cheek," wrote Ward Muir, a British journalist who had worked as an orderly with Wood. "The shut eye must be opened, so that the other eye, the eye-to-be, can be matched to it. With dexterous strokes the sculptor opens the eye. The squeeze, hitherto representing a face asleep, seems to awaken. The eye looks forth at the world with intelligence."

This plasticine likeness was the basis of all subsequent portraits. The mask itself would be fashioned of galvanized copper one thirty-second of an inch thick—or as a lady visitor to Ladd's studio remarked, "the thinness of a visiting card." Depending upon whether it covered the entire face, or as was often the case, only the upper or lower half, the mask weighed between four and nine ounces and was gen-

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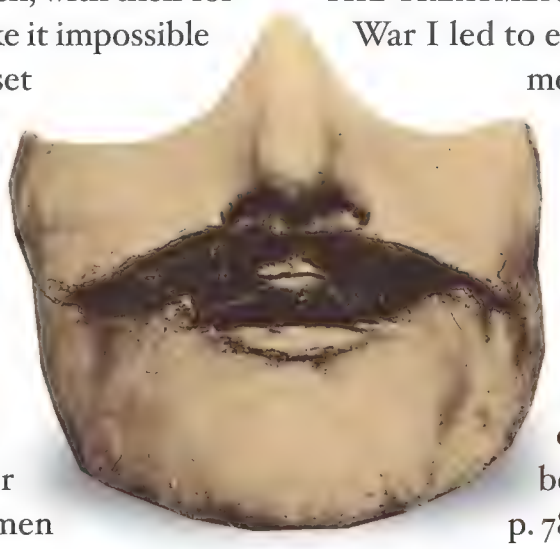
erally held on by spectacles. The greatest artistic challenge lay in painting the metallic surface the color of skin. After experiments with oil paint, which chipped, Ladd began using a hard enamel that was washable and had a dull, flesh-like finish. She painted the mask while the man himself was wearing it, so as to match as closely as possible his own coloring. "Skin hues, which look bright on a dull day, show pallid and gray in bright sunshine, and somehow an average has to be struck," wrote Grace Harper, the Chief of the Bureau for the Reeducation of Mutilés, as the disfigured French soldiers were called. "The artist has to pitch her tone for both bright and cloudy weather, and has to imitate the bluish tinge of shaven cheeks." Details such as eyebrows, eyelashes and mustaches were made from real hair, or, in Wood's studio, from slivered tinfoil, in the manner of ancient Greek statues.

Today, the only images of these men in their masks come from black-and-white photographs which, with their forgiving lack of color and movement, make it impossible to judge the masks's true effect. Static, set for all time in a single expression modeled on what was often a single prewar photograph, the masks were at once lifelike and lifeless: Gillies reports how the children of one mask-wearing veteran fled in terror at the sight of their father's expressionless face. Nor were the masks able to restore lost functions of the face, such as the ability to chew or swallow. The voices of the disfigured men who wore the masks are for the most part known only from meager correspondence with Ladd, but as she herself recorded, "The letters of gratitude from the soldiers and their families *hurt*, they are so grateful." "Thanks to you, I will have a home," one soldier had written her. ". . . The woman I love no longer finds me repulsive, *as she had a right to do.*"



By the end of 1919, Ladd's studio had produced 185 masks; the number produced by Wood is not known, but was presumably greater, given that his department was open longer and his masks were produced more quickly. These admirable figures pale only when held against the war's estimated 20,000 facial casualties.

By 1920, the Paris studio had begun to falter; Wood's department had been disbanded in 1919. Almost no record of the men who wore the masks survives, but even within Ladd's one-year tenure it was clear that a mask had a life of only a few years. "He had worn his mask constantly and was still wearing it in spite of the fact that it was very battered and looked awful," Ladd had written of one of her studio's early patients.

In France, the Union des Blessés de la Face (the Union of the Facially Wounded) acquired residences to accommodate disfigured men and their families, and in later years absorbed the casualties of subsequent wars. The fate of similarly wounded Russians and Germans is more obscure, although in postwar Germany, artists used paintings and photographs of the facially mutilated with devastating effect in antiwar statements. America saw dramatically fewer casualties: Ladd reckoned that there were "between two and three hundred men in the American army who require masks"—a tenth the number required in France. In England, sentimental schemes were discussed for the appropriation of picturesque villages, where "maimed and shattered" officers, if not enlisted men, could live in rose-covered cottages, amid orchards and fields, earning their living selling fruit and weaving textiles by way of rehabilitation; but even these inadequate plans came to naught, and the men simply trickled away, out of sight. Few, if any, masks survive. "Surely they were buried with their owners," suggested Wood's biographer, Sarah Crellin.

THE TREATMENT of catastrophic casualties during World War I led to enormous advances in most branches of medicine—advances that would be used to advantage, mere decades later, treating the catastrophic casualties of World War II. Today, despite the steady and spectacular advance of medical techniques, even sophisticated modern reconstructive surgery can still not adequately treat the kinds of injuries that condemned men of the Great War to live behind their masks (See "Rivaling Nature?" p. 78, on new strategies to treat the facially injured soldiers of the Iraq war).

Anna Coleman Ladd left Paris after the armistice, in early 1919, and was evidently sorely missed: "Your great work for the French mutilés is in the hands of a little person who has the soul of a flea," a colleague wrote to her from Paris. Back in America, Ladd was extensively interviewed about her war work, and in 1932, she was made a Chevalier of the French Legion of Honor. She continued to sculpt, producing bronzes that differed remarkably little in style from her prewar pieces; her war memorials inevitably depict granite-jawed warriors with perfect—one is tempted to say mask-like—features. She died at age 60 in Santa Barbara in 1939.

Francis Derwent Wood died in London in 1926 at age 55. His postwar work included a number of public monuments, including war memorials, the most poignant of which, perhaps, is one dedicated to the Machine Gun Corps in Hyde Park Corner, London. On a raised plinth, it depicts the young David, naked, vulnerable, but victorious, who signifies that indispensable figure of the war to end all wars—the machine-gunner. The monument's inscription is double-edged, alluding to both the heroism of the individual gunner and the preternatural capability of his weapon: "Saul hath slain his thousands, but David his tens of thousands."

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Ahead in the Clouds

Susan Solomon helped patch the ozone hole. Now, as a leader of a major United Nations report—out this month—she's going after global warming

BY VIRGINIA MORELL

THIS MONTH, when the United Nations and the World Meteorological Organization release their first major report on global climate change in six years, two things are likely to happen. Some people will dismiss it. And Susan Solomon will grow hoarse explaining why they shouldn't.

A no-nonsense 51-year-old atmospheric chemist, she's a co-leader of the massive new study, along with Qin Dahe, a climatologist from the China Meteorological Administration in Beijing. Solomon will become the public face of the U.N. report, in charge of presenting the best scientific thinking on the subject of global warming and the evidence that it is caused by the burning of fossil fuels. "The science is strong," she says, "and we'll be presenting a consensus view."

To reach that consensus, Solomon logged more than 400,000 air miles over the past four years and held dozens of meetings with the report's more than 500 authors. "This much I can say: the climate is changing and quite noticeably," she says shortly before the report is released. In her paper- and book-crammed office at the National Oceanic and Atmospheric Administration in Boulder, Colorado, she suggests that policy makers (and the rest of us) have reached a critical moment in our dealings with, or failings to deal with, climate change: "The effects will vary from region to region, and the challenge that society will face is to get people to think beyond their own backyards and to make judgments about the risks they're willing to take."

Maybe as the climate continues to warm, the ice caps won't melt; maybe a rising sea level will be offset by some other unforeseen event. She's reminded of the scene in *Dirty Harry* in which the cop played by Clint Eastwood confronts a criminal: "You've got to ask yourself one question: Do I feel lucky? Well, do ya, punk?" Solomon says, "That's what we as a society have to decide. Will we choose to go down the same path, or will we make some changes in our behaviors? You could say that the gun of climate change is pointed at us. So, how lucky do we feel?"

Scientists who study climate change or other environmental problems often feel like Cassandra, the mythical prophetess of the Trojan War who was cursed to foretell the future but not to be believed. But Solomon doesn't see herself that way at all. She's more optimistic than many of her climatology peers, and with good reason: she was a prime mover behind one of the most important global environmental turnarounds in history, repairing the hole in the ozone layer above Antarctica.

Solomon made her first trip to the McMurdo Station in Antarctica in August 1986. She and her 15-man team went there to study a puzzling new phenomenon that British researchers had reported the year before: earth's protective ozone layer had begun to thin above the Antarctic. The planet was losing its best natural defense against the sun's ultraviolet radiation, which causes cancer and cataracts in people and can damage crops.

The plane landed in the middle of the day, in dark that was "like twilight at noon," Solomon recalls. Solomon was just 30. She'd completed her doctorate at the University of California at Berkeley five years earlier, and she was an out-and-out geek, a theoretician who used a computer to model the chemistry of the atmosphere. Although she had no field experience, she'd been chosen leader of the first National Ozone Expedition to the Antarctic in part because she was one of the few scientists to take the ozone hole seriously. And she had devised a theory to explain it.

The suspected culprit was chlorofluorocarbons (CFCs), because earlier studies had shown that these compounds, most of which are gases at room temperature, could damage earth's ozone shield. Invented in the 1920s, CFCs (made by linking atoms of chlorine, fluorine and carbon) had been put to use as aerosol propellants in hair spray and the like; CFCs were excellent coolants, too, and soon were in every refrigerator and air conditioner. But when released into the lower atmosphere—as they were with every squirt of an aerosol spray can—they drift with the winds up into the stratosphere. There, ultraviolet rays kick chlorine atoms out of CFCs, and each freed chlorine atom goes on to break apart as many as 100,000 ozone molecules.

The scientists who demonstrated the ozone-eating ability of CFCs—they would later earn a Nobel Prize in Chemistry for the work—believed that the degradation high in the atmosphere would be slow, taking perhaps hundreds of

MARC PISCOTTY / WPN

years. Yet the ozone shield was disintegrating quickly. "And the thinning wasn't supposed to show up over Antarctica first," Solomon recalls, "since that's not where these chemicals were being used."

She came up with an explanation after noticing something that others had overlooked: the ozone depletion was occurring in the lower stretches of the ozone layer, about eight miles above the earth, rather than in the stratosphere's upper reaches. A self-confessed "weather-weenie" who loves watching summer afternoon thunderheads over the Rockies, Solomon knew that unusual clouds often form above the Antarctic each austral winter and spring. They are so full of ice crystals they shimmer like abalone shells. The crystals contain nitric and sulfuric acids, and Solomon speculated that when chlorine compounds came into contact with these cold, acidic clouds, the chlorine was transformed into rabid ozone-eating chemicals.

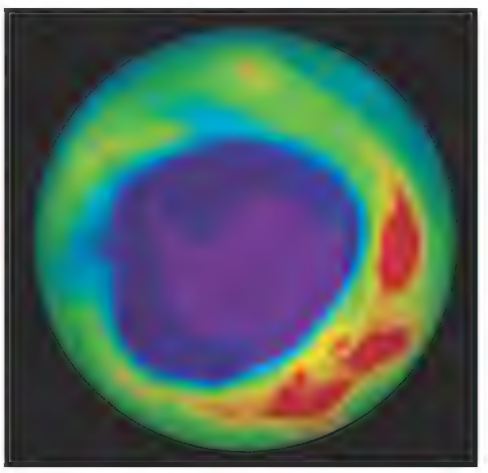
"It was radical," says Mack McFarland, a chemical physicist at DuPont Corporation who previously worked with Solomon at NOAA. "She was suggesting a completely new area of chemistry for the atmosphere—that there could be reactions not just between molecules but on molecules in the ozone layer and at incredibly low temperatures. Other people had a hard time accepting that."

Yet it was viewed as an idea worth testing, and Solomon was put in charge of the 1986 expedition, which was organized by NOAA and NASA. En route to Antarctica, a reporter in New Zealand asked her what it was like to be the only woman among so many men. "Gosh," she quipped. "They are all men, aren't they?"

In their three months at McMurdo, Solomon and her team worked out of a small wooden cabin outfitted with computers and a visible light spectrometer, an instrument the size of a portable sewing machine. The scientists analyzed light for wavelengths that indicate the presence of ozone, chlorine dioxide and other ozone-depleting chemicals. They took turns standing on the cabin roof and directing moonlight through a tube and into the spectrometer. It was so cold, dipping to minus 40 degrees, that one night Solomon's right eyelid froze shut. Not a problem. "I'm a theoretician," says Solomon. "I'd never collected any data for any experiment before, and I just loved it."

Solomon and her colleagues not only confirmed that the ozone hole was real, but they also showed that it was being caused by chemical reactions between CFCs and the polar stratospheric clouds, just as Solomon had predicted. "Scientists were surprised but relieved," McFarland recalls. "We knew the cause and could do something about it."

Only a year after Solomon's research was published, governments started to act. Representatives from 24 nations met in Montreal in 1987 and signed a treaty to limit the use of CFCs. (The United States and other countries had already banned CFCs as propellants in aerosol cans, based on the early studies of their potential for harming the atmosphere, but the chemicals were still being used in refrigerators, air conditioners and cleaning solvents.) Today, more than 180 countries, including the United States, have signed the "Montreal Protocol on Substances that Deplete the Ozone Layer" as well as amendments calling for a complete ban on CFCs. In 2000, President Cinton awarded Solomon the National Medal of Science for her ozone hole research; the citation praised her "for exemplary service to worldwide public policy decisions and to the American public." She was one of the youngest members to be elected to the National Academy of Sciences, the country's most elite scientific organization.



The ozone hole over Antarctica (in 2005) is recovering. Can the lessons be applied to today's climate crisis?

The earth's ozone layer has stabilized in the past ten years, and although CFCs from old refrigerators are still floating up into the atmosphere, almost no new ones are being produced. Climate scientists predict that the ozone hole over Antarctica will disappear by the end of this century and the ozone layer over the rest of the planet will thicken back up. "With luck, I'll live long enough to see the layer close to being fully restored," Solomon says.

Part of that environmental success can be credited to the company that manufactured most of the world's CFCs, DuPont. It announced in 1988 that it would voluntarily stop CFCs production, and company chemists soon devised replacement chemicals for air conditioners and refrigerators.

Solomon knows the current climate crisis won't be as easy to solve as the ozone problem. (The ozone hole does not contribute noticeably to global warming.) For one thing, the health dangers of global warming, such as a possible increased range for malaria and other tropical diseases caused by warm-weather microbes, may not be immediate or dramatic. And there's no simple alternative to the burning of fossil fuels. But she's hopeful that the science presented in this month's report will inform public attitudes about global warming. "I don't think people realize how much solid data scientists have or what the data mean," she says, referring to the dramatic increase in global temperatures in the past few decades. "I'm an optimist," she adds with a smile. "I really do believe that we and our governments will do the right thing."

VIRGINIA MORELL *is the author of* Ancestral Passions *and* Blue Nile*, and a co-author of* Wildlife Wars.

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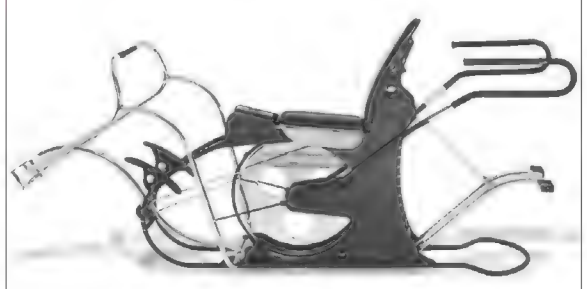

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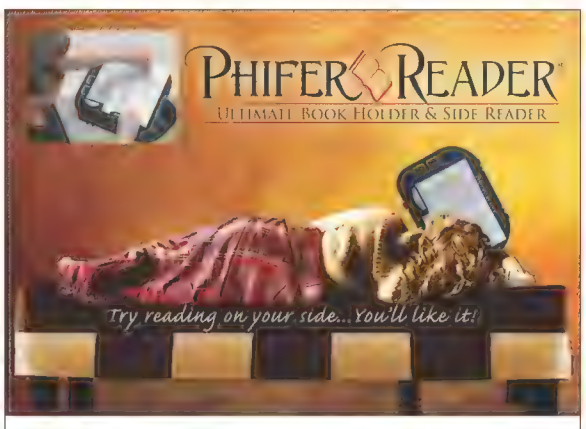

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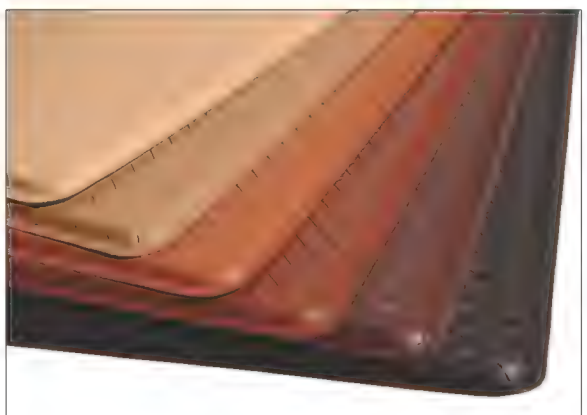

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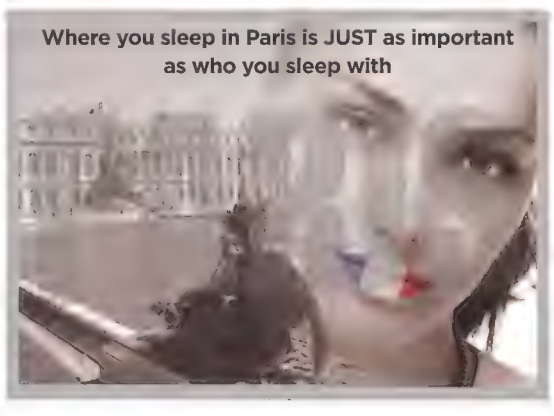

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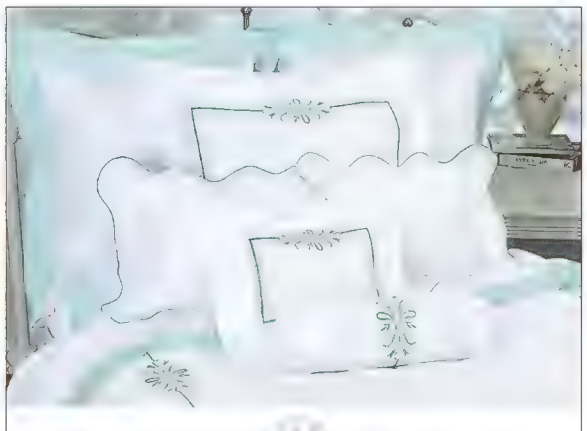

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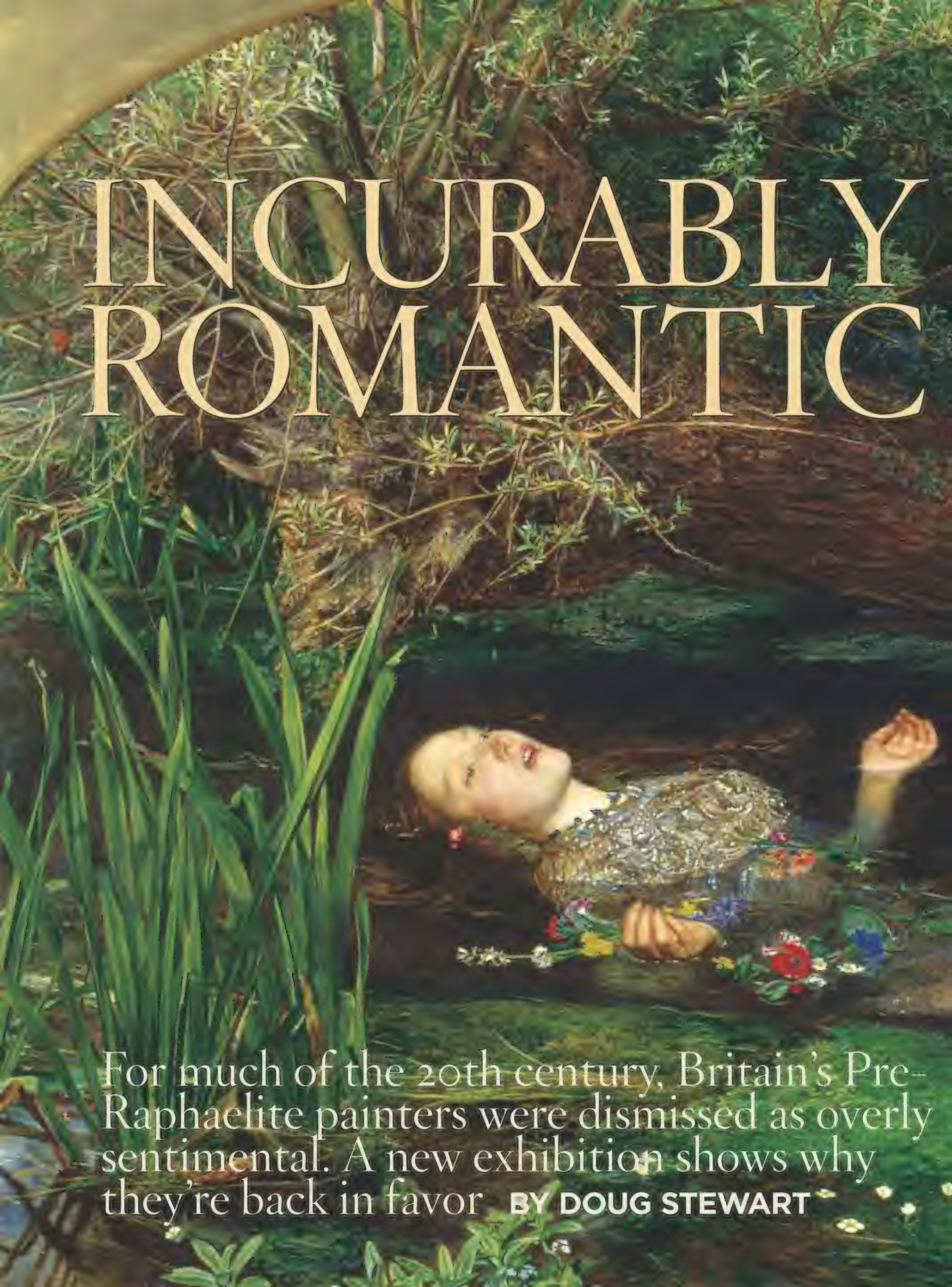


For much of the 20th century, Britain's Pre-Raphaelite painters were dismissed as overly sentimental. A new exhibition shows why they're back in favor **BY DOUG STEWART**

Subjects drawn from the plays of Shakespeare were popular with the 19th-century artists known as the Pre-Raphaelites. Elizabeth Siddall, a young shopgirl, was the model for John Everett Millais' lyrical *Ophelia* (1852).

THE SULTRY FIGURE combs her golden hair and gazes at a mirror; her dressing gown has slipped off one shoulder. In a sonnet inscribed on the painting's elaborate gold frame, the artist, a London poet and painter named Dante Gabriel Rossetti, identified his subject as Lilith, Adam's first wife—"the witch he loved before the gift of Eve."

Adding a hint of menace, Rossetti garnished the scene with poisonous foxglove and an opium poppy (whose narcotic, it was widely known, had killed his own wife a few years before). Rossetti filled the background of the picture with sprays of white roses. With characteristic thoroughness, he had procured a huge basket of fresh-cut roses from which to work. And not just any roses, but those gathered from the personal garden of England's most influential art critic, John Ruskin. If you could curry favor with the critics by painting their flowers, why not, Rossetti must have thought.

Lady Lilith is the centerpiece of an exhibition called "Waking Dreams: The Art of the Pre-Raphaelites from the Delaware Art Museum." (Rossetti and his fellow Pre-Raphaelite painters adopted the cryptic label in the late 1840s to signify their belief that art history had taken a wrong turn with Raphael during the Renaissance.) Widely if not universally praised in its time, disdained as mawkish and heavy-handed throughout much of the 20th century, the Pre-Raphaelites' emotionally charged art is today enjoying a renaissance of its own.

"I shut myself in with my soul," wrote poet and artist Dante Gabriel Rossetti (above, in 1863), "and the shapes come eddying forth."

The "Waking Dreams" title alludes to the otherworldliness of these paintings: the artists depicted ethereal, often imaginary figures from legends and myths with the exactitude and finish of commissioned portraits, invariably using true-to-life props and live models. The latter figured prominently, as it happened, in the turbulent, sometimes scandalous romantic lives that many of these painters led, in defiance of Victorian propriety.

The current exhibition draws from the extensive collection of Pre-Raphaelite art amassed by Delaware textile manufacturer Samuel Bancroft Jr. (1840-1915) that his heirs bequeathed to the Delaware museum in 1935. Organized and circulated by Art Services International (a nonprofit institution based in Alexandria, Virginia, that arranges fine art touring exhibitions), the show includes some 130 oil paintings, drawings and watercolors, as well as woodcuts, jewelry, ceramics, stained glass and furniture. On view at the St. Louis Art Museum (February 18-April 29), after a two-year cross-country itinerary, the exhibition will conclude its tour at the San Diego Museum of Art (May 19-July 29).

In the latter half of the 19th century, the term "Pre-Raphaelite" became something of a catchall for a loosely affiliated group of English artists with often disparate styles. "What binds the early work with the later material," says British art historian and biographer Jan Marsh, "is the poetic subject matter, the rather dreamy mythological sources, as well as the use of color and lush decorative detail—the sense of unheard music in the paintings."

The movement arose in 1848, a year of revolutions across Europe, when a small band of young, middle-class artists in London began plotting to overthrow the staid English art world. Led by the charismatic Rossetti, the more technically polished John Everett Millais, and William Holman Hunt, at 21 the oldest of the three, the young artists formed a secretive, tightknit circle, the Pre-Raphaelite Brotherhood—hence the initials "P.R.B." inscribed on some of their early canvases—which held monthly meetings and compiled lists of likes and dislikes. Chief among the latter, aside from Raphael, Titian and their High Renaissance ilk, was the late Sir Joshua Reynolds (or "Sir Sloshua," as Millais and Hunt dubbed him for what they saw as his sketchy brushwork). Reynolds, the first president of the Royal Academy, had promulgated rules for painting based on conventions from neo-Classical and late Renaissance art: subjects should be edifying, colors subdued, compositions either pyramidal or S-shaped, with an emphasis on the use of chiaroscuro, and so on. To the Pre-Raphaelites, this was intolerable. Reynolds and the academy, they felt, had idealized beauty—and a mannered, old masters style of beauty at that—at the expense of *truth*.

Truth was to be found in medieval or "primitive" art, a

Regular contributor **DOUG STEWART** *wrote about painter Amedeo Modigliani for the March 2005 issue of* SMITHSONIAN.

GRANGER COLLECTION, NY; PP. 86,87 TATE GALLERY, LONDON / ART RESOURCE, NY; P. 89 DELAWARE ART MUSEUM

Rossetti identified the subject of his *Lady Lilith* painting as Adam's first wife—"the witch he loved before the gift of Eve." The work (1866-68) was altered in 1872-73 to please patron Frederick Leyland. The original model was Rossetti's lover Fanny Cornforth.

The precise rendering of Ford Madox Brown's *Romeo and Juliet* (1869-70) prompted one critic to say that the exacting detail "hinders instead of assisting our imagination."

notion they based in large part on a few engravings they'd seen of early Italian frescoes. To achieve it, the young artists pored over early literature—the Bible, Chaucer, the tales of King Arthur—and the poetry of John Keats and Alfred Tennyson. They painstakingly portrayed fair damsels and brave knights. Under their influence, pioneering photographer Julia Margaret Cameron enlisted two individuals to pose for her dressed up as Lancelot and Guinevere.

One of the more dramatic paintings in the exhibition depicts an athletic Romeo (above) stepping onto a rope ladder from Juliet's balcony while continuing to nuzzle her neck. The work was done on commission by Ford Madox Brown, a slow-working perfectionist slightly older than his fellow Pre-Raphaelites. In it, Brown indulged his taste for exactitude, from the leaded-glass windowpanes of Juliet's bedchamber to the laces on Romeo's tunic. (For his Romeo model, Brown chose, yes, John Ruskin's personal secretary, Charles Augustus Howell.) The ladder and other details were so realistic, one critic noted, that it "hinders instead of assisting our imagination."

In his *Modern Painters* (1843), Ruskin had charged artists to "go to Nature in all singleness of heart, and walk with her laboriously and trustingly . . . rejecting nothing, selecting nothing, and scorning nothing." The Pre-Raphaelites took this as their credo. To them, nature was precisely what they saw in front of them—after a bit of stage management, perhaps. For one painting, Rossetti borrowed a silver wash basin from the wealthy patron who had commissioned the work; when Rossetti told the patron he would have preferred a gold one, the man suggested the artist just pretend it was gold. Retrieving his wash basin later, the patron discovered to his distress that the artist had, in fact, had it gilded.

The Brotherhood began exhibiting in 1849, to many critics' dismissive bafflement. "We cannot censure at present as amply or as strongly as we desire to do, that strange disorder of the mind or the eyes which continues to rage with unabated absurdity among a class of juvenile artists who style themselves P.R.B.," wrote a *London Times* reviewer after an 1851 exhibit. Ruskin lost no time in firing off a letter to the editor. "There has been nothing in art," he declared, "so earnest and complete as these pictures since the days of Albert Dürer." Reviewers thereafter toned down their criticism, and admirers began speaking up—and buying paintings. In 1854, under Ruskin's prodding, even England's conservative *Art Journal* conceded that the Pre-Raphaelites had helped rid English painting of "that vice of 'slap-dash' which some of our painters a few years ago considered excellence."

John Everett Millais, a Ruskin favorite, had been helping support his family by selling his artwork since he was 16. In 1853, Ruskin invited the then 24-year-old artist to accompany him and his young wife on a four-month sojourn in rural Scotland, during which Millais was to paint the critic's portrait. On the trip, Ruskin was often absent, and Millais passed the time painting small studies of Ruskin's wife, Euphemia, or Effie. As Effie modeled, an intimacy developed between the two. She confessed to Millais she was still a

DELAWARE ART MUSEUM

"maiden" after five years of marriage. The painter and his subject soon realized they were in love. The following year Effie sued for an annulment on the grounds that Ruskin had failed to consummate their union. In the midst of the ensuing scandal, Ruskin, professing no hard feelings, directed Millais to return to Scotland to resume work on some rocks in his portrait—rocks on which the painter had already labored for more than three months. "He is certainly mad," Millais wrote to Effie's sympathetic mother, "or has a slate loose." About a year later, Effie became Mrs. Millais. The marriage would produce eight children.

WITH HIS PASSION for medieval art and literature and especially for the poetry of Dante, his namesake, Dante Gabriel Rossetti was the inspirational leader of the Pre-Raphaelites. An impulsive, thickset womanizer with penetrating, heavy-lidded eyes and a pouty lower lip, Rossetti was never as skillful a painter as Millais nor as devoted to Ruskin's ideals as some, but his imagination teemed. "I shut myself in with my soul, and the shapes come eddying forth," he once wrote. He often inscribed poetry directly on a picture's frame to heighten the impact of his imagery—in fact, he was better known during his lifetime for his romantic poetry (his sister, Christina Rossetti, was also an acclaimed poet) than his paintings, perhaps because he refused to show them to the public. This was partly on principle, as he despised the Royal Academy, which was England's all-important exhibiting venue, and partly because he was so sensitive to criticism, despite a swaggering self-confidence that some saw as arrogance.

"Rossetti was a devil-may-care character whom you don't expect to find in the rather staid world of 19th-century English painting," says Stephen Wildman, director of England's Ruskin Library and formerly curator at the Birmingham Museum and Art Gallery, a major Pre-Raphaelite repository. "He was a bohemian who courted celebrity." And his social transgressions were the most overt.

As a group, the painters were drawn to working-class women, many of whom were happy to model—unchaperoned—for a shilling an hour. Ford Madox Brown sent his favorite, a working-class teenager named Emma Hill, to a local ladies' seminary to acquire social and domestic graces before finally agreeing to marry her more than two years after she bore their first child. Similarly, William Holman Hunt arranged for reading and comportment lessons for Annie Miller, a voluptuous young woman whom he later described as "using the coarsest and filthiest language" when they first met. Hunt's efforts at playing Pygmalion failed, however, and Miller soon took up with other men, including Rossetti.

But the fairest of them all was Elizabeth Siddal, a pale, long-limbed and utterly self-possessed redhead who worked as a bonnet-shop clerk. Her beauty, combined with an ability to hold a pose for hours, made her a favorite model for several of the Pre-Raphaelites. In 1852, she posed in a bathtub for Millais' masterpiece, *Ophelia* (pp. 86-87); the hours in cold water, alas, were followed by a severe cold that lingered for months. Siddal's frail, unconventional looks entranced Rossetti especially, who was soon insisting she pose only for him. He gave her drawing lessons and periodically promised to marry her. After visiting Rossetti's studio in 1854, Ford Madox Brown wrote in his diary that Lizzie, as she was known, looked "thinner & more deathlike & more beautiful & more ragged than ever." During this time, Rossetti put off commissioned work and sketched and painted his "fiancée" obsessively.

Siddal was often sick; she was most likely anorexic. (According to Rossetti's letters, she shunned food for days at a time, typically during periods when he had been neglecting her.) Her condition was worsened by depression and an

Critic John Ruskin (at far left, with Rossetti in 1863) invited John Everett Millais to paint his portrait in 1853. Millais and Ruskin's neglected wife, Effie, fell in love and eventually married (center, in 1865 with two of their children). William Holman Hunt (far right, photographed c. 1867 by Julia Margaret Cameron) arranged for comportment lessons for one of his models, Annie Miller.

BETTMANN / CORBIS; WIKIPEDIA.COM; RÉUNION DES MUSÉES NATIONAUX / ART RESOURCE

addiction to laudanum, an opiate. Rossetti, meanwhile, had liaisons with other women, often openly. "I loathe and despise family life," he once told a friend. He and Siddal separated and reunited repeatedly until, in 1860, they were finally married. The birth of a stillborn child the following year may have contributed to the drug overdose that killed her several months later. As she lay in her coffin, a distraught Rossetti placed a notebook of his unpublished poems in her long red hair. Seven years later, deciding he wanted to publish the poems after all, he arranged for her body to be exhumed in order to retrieve the notebook.

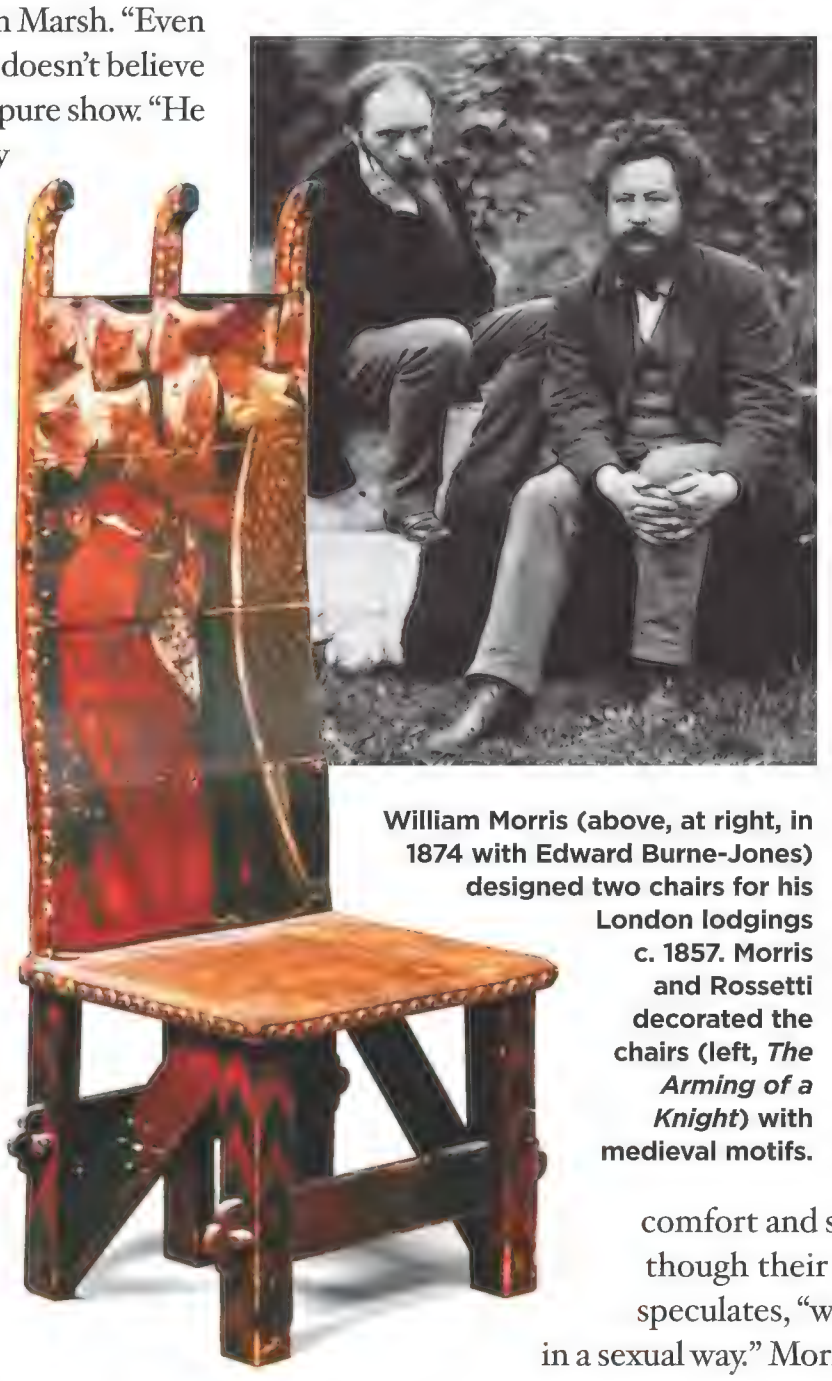
"It's one of those things for which posterity has never forgiven him," says biographer Jan Marsh. "Even now, it shocks people." Marsh doesn't believe Rossetti's original gesture was pure show. "He had married Siddal after they had really fallen out of love because he was honoring his original promise to her. I think burying this manuscript book with her had been an expression of genuine grief and regret, because he hadn't managed to save her from her demons." Rossetti wanted to do the right thing. "Most of the time," she says, "he just couldn't bring himself to do it."

The same might be said of Edward Burne-Jones, an early Rossetti acolyte, though their personalities could not have been more different. Part of a second wave of Pre-Raphaelite artists who emerged in the late 1850s, the introverted, romantic Burne-Jones was reportedly prone to fainting. He was fixated on medieval legends. One of his favorite books, and an inspiration for much of his artwork, was Sir Thomas Malory's *Le Morte d'Arthur*, a bracing mix of bravery, romance and mysticism.

In 1856, Burne-Jones and fellow Oxford dropout and medievalist William Morris rented rooms together in London's Red Lion Square, which they furnished in their own version of Gothic Revival. With Rossetti's help, Morris, a writer and artist, designed a pair of high-backed chairs and decorated them with scenes of knights and ladies. The sturdy, faux-medieval chairs foreshadowed the handicrafts of England's Arts and Crafts Movement, which Morris—aided by Rossetti and Burne-Jones, among others—helped launch, and would later lead. Burne-Jones' own works were typically intricate fantasies peopled by distant, somewhat androgynous figures.

Burne-Jones' obsession with enchanted lovers was in jarring contrast to his own marriage. His muse-model-lover was not his wife, Georgiana, but a high-strung and ravishingly beautiful sculptress, Maria Zambaco, with whom he carried on a poorly concealed love affair from the late 1860s into the 1870s. Burne-Jones tried, in 1869, to abandon his reserved and uncomplaining wife, but he collapsed in Dover as he and Zambaco prepared to board a steamer for France; on his return, Georgiana stoically nursed him back to health.

Like other Pre-Raphaelites, Burne-Jones painted scenes that mirrored his own troubled life. His renderings of Zambaco—whom he continued to use as a model even after their affair became a semipublic scandal—are among his boldest and most assured paintings. One watercolor shows her in profile, as idealized as a Greek goddess. In the huge oil painting (opposite) for which the watercolor was a study, her unpinned hair has become a tangle of snakes: she is the witch Nimue turning a helpless Merlin, the Arthurian wizard, into a hawthorn tree. At the 1877 opening of London's Grosvenor Gallery, a rival to the Royal Academy, the painting attracted crowds and flattering reviews: one critic hailed Burne-Jones as "a genius, a poet in design and colour, whose like has never been seen before."



William Morris (above, at right, in 1874 with Edward Burne-Jones) designed two chairs for his London lodgings c. 1857. Morris and Rossetti decorated the chairs (left, *The Arming of a Knight*) with medieval motifs.

For her part, Georgiana turned to her husband's best friend—William Morris—for comfort and support; Morris reciprocated, although their relationship, Stephen Wildman speculates, "was probably never consummated in a sexual way." Morris apparently had plenty of time to devote to the neglected Georgiana because his own wife, Jane, had taken up with the tireless Rossetti.

Jane Morris, like Lizzie Siddal, was a woman whose exotic looks—tall and pale with thick, wavy black hair, high cheekbones and large melancholy eyes—turned heads. The daughter of a stableman, she had modeled as a teenager for both Rossetti and Morris. Rossetti had continued to use her as a model after she married Morris in 1859, at 19. On the first of many full-scale portraits, he wrote in Latin a half-serious, half-boastful inscription: "Jane Morris AD 1868 D. G. Rossetti. . . . Famous for her poet husband and surpassingly famous for her beauty, now may she be famous for my painting."

LEFT: DELAWARE ART MUSEUM; RIGHT: VICTORIA & ALBERT MUSEUM, LONDON / ART RESOURCE

LADY LEVER ART GALLERY, NATIONAL MUSEUMS LIVERPOOL / BRIDGEMAN ART LIBRARY

"A genius, a poet in design and colour, whose like has never been seen before," one critic raved about Edward Burne-Jones when the artist's painting *The Beguiling of Merlin* (for which his mistress and muse, Maria Zambaco, posed) was shown in London in 1877.

By the summer of 1871, Rossetti and Morris' wife were living together openly at Kelmscott Manor, a country house in Oxfordshire. (William had sailed to Iceland that summer to immerse himself in the settings of the Norse myths he loved.) For Rossetti and his "Janey," it was a blissful interlude that couldn't last, given her marital status. Even if one's marriage was a sham, divorce made a woman a social pariah in the Victorian era. In Rossetti's *Water Willow* (right), Jane holds a willow branch, a symbol of sadness and longing, with Kelmscott in the background.

The Brotherhood had scorned the idealizing tendencies of the Renaissance, but by the 1870s, Rossetti was putting his own unnatural ideal on canvas: femmes fatales, or "stunners," as they were known, with dreamy eyes and luscious lips set off with velvet, jewelry and flowers. "It's the opposite of where the Pre-Raphaelites started," says Margaretta Frederick, curator of the Delaware Art Museum's Bancroft Collection. "Most of his patrons were industrialists from the Midlands with new wealth, as opposed to aristocrats, who were traditionally the people who collected art in England." Many of these industrialists preferred to decorate their homes with pictures of attractive young women rather than stuffy academic art.

While William Morris was in Iceland, his wife, Jane (at left), spent the summer of 1871 with Rossetti. The willow branches she holds in the portrait Rossetti painted of her (above) symbolize sorrow and longing.

Rossetti's late work made him prosperous, but he enjoyed his success only briefly: addicted to chloral hydrate, a popular narcotic, he died at age 53, in 1882. In time, both Millais and Burne-Jones were elected to the Royal Academy—Millais eagerly, Burne-Jones reluctantly. Most of the important Pre-Raphaelites were dead by 1900, though their artistic ideas lived on. "There was a strand in British art you could identify as Pre-Raphaelite that continued well into the 20th century," says Wildman. "It became less fashionable as modernism gathered force, but it never quite died." The artists' evocative imagery, laden with psychosexual overtones, helped pave the way for Symbolism and Surrealism, while the quasi-photographic style of the later Pre-Raphaelites influenced the painterly look and themes of pictorial photography.

"Pre-Raphaelite art went out of favor for quite some time, along with most of Victorian art," says the Delaware Art Museum's Frederick. "It didn't really come back until about the 1960s." Over the past couple of decades, the work has become increasingly popular. Beginning with a major retrospective of Burne-Jones' work at New York City's Metropolitan Museum of Art in 1998, a string of exhibitions of Pre-Raphaelite art has drawn crowds in both Europe and the United States. At auctions in 2000, a Rossetti chalk drawing of Pandora sold for $3.9 million—five times its high estimate—and a painting by late Pre-Raphaelite artist J. W. Waterhouse fetched nearly $10 million, a record for a Victorian painting. The popularity of Laura Ashley clothing in the 1970s and '80s and, more recently, the hippie-Guinevere fashion designs of Anna Sui and Mary McFadden have been linked to a renewed appreciation for the Pre-Raphaelite look.

Georgiana Burne-Jones, despite the pain her husband's near-abandonment caused her, was able to aptly sum up that appeal: "Think what it is," she once said, "to see a poem lived."

TOP: DELAWARE ART MUSEUM; BOTTOM: STAPLETON COLLECTION / CORBIS

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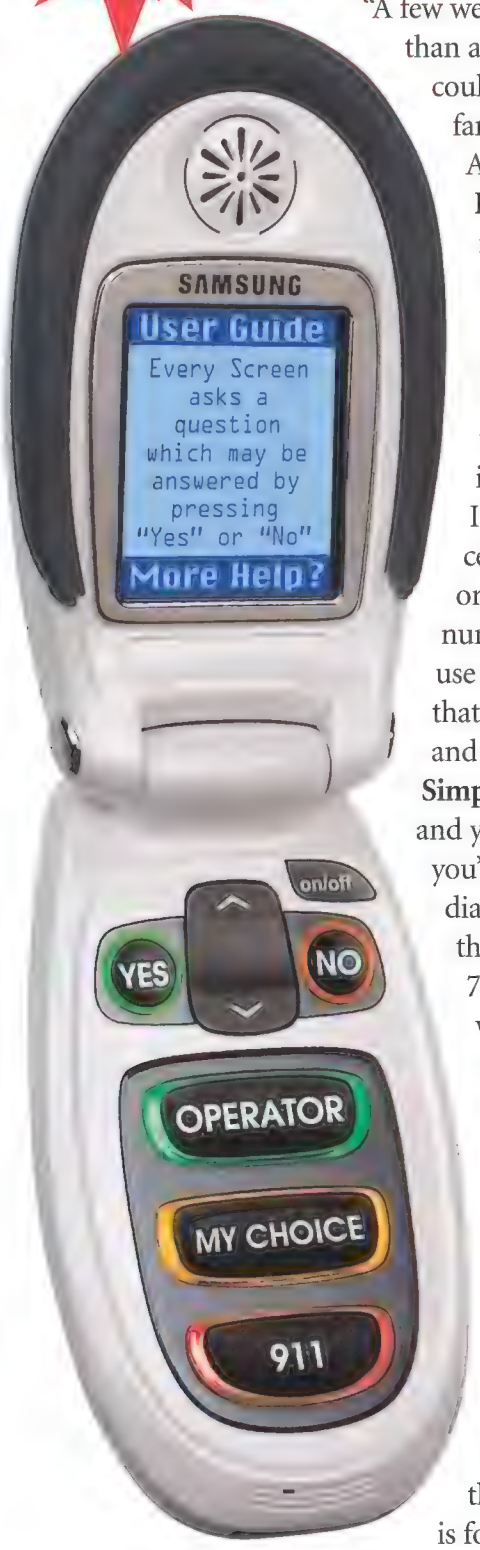

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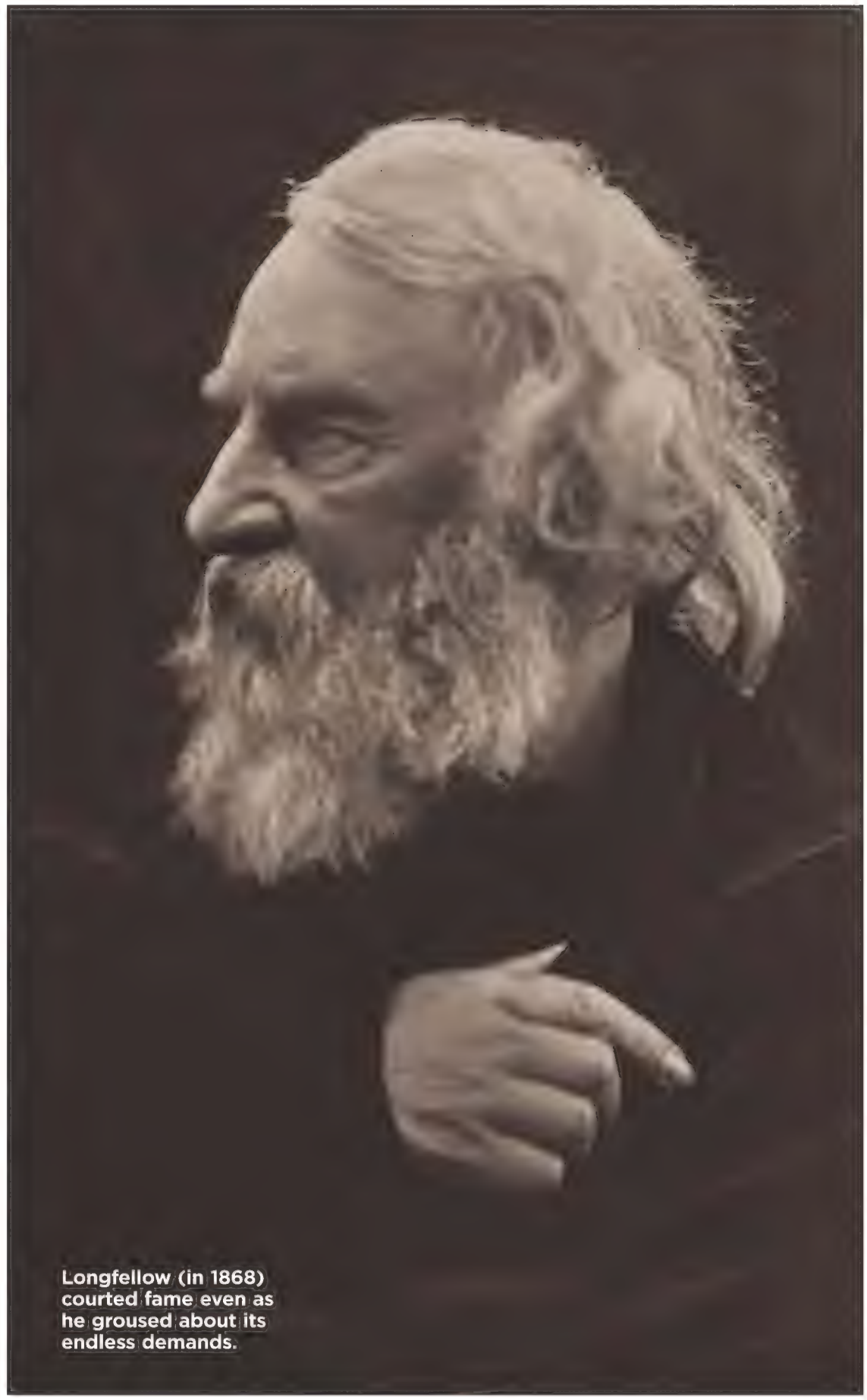
Famous Once Again

Longfellow reaches his bicentennial; here's why his poems became perennial **BY NICHOLAS A. BASBANES**

EVEN IN HIS later years, Henry Wadsworth Longfellow did not mind birthdays. He inspired others to celebrate right along with him. His 70th, for example, took on the air of a national holiday, with parades, speeches and lots of his poetry. "My study is a garden of flowers," he wrote in his journal on February 27, 1877, with "salutations and friendly greetings from far and near" filling his house in Cambridge, Massachusetts.

By then, Longfellow was a celebrity of almost modern magnitude—"the object of a national adulation enjoyed by few poets before or since," according to Andrew R. Hilen, who edited a comprehensive edition of the poet's correspondence. He was dazzlingly prolific, equally adept at prose, drama and poetry, and a scholar as well; his translation of Dante's *Divine Comedy* was the first in America. He also had the good fortune to come along just as the United States was forming a distinctive cultural identity. "Longfellow did as much as any author or politician of his time to shape the way 19th-century Americans saw themselves, their nation and their past," says Dana Gioia, chairman of the National Endowment for the Arts.

Today, only people of a certain age can recall the Longfellow poetry they memorized as schoolchildren, perhaps passages from "Paul Revere's Ride" or "The Wreck of the Hesperus" or "The Village Blacksmith." Many more speak of "the patter of little feet" or "ships that pass in the night," or declare, "I shot an arrow into the air" or "Into each life some rain must fall," without realizing that those words, too, are his. If his contemporaries celebrated him as an American bard, subsequent generations pushed him to the margins as a relic.



Longfellow (in 1868) courted fame even as he groused about its endless demands.

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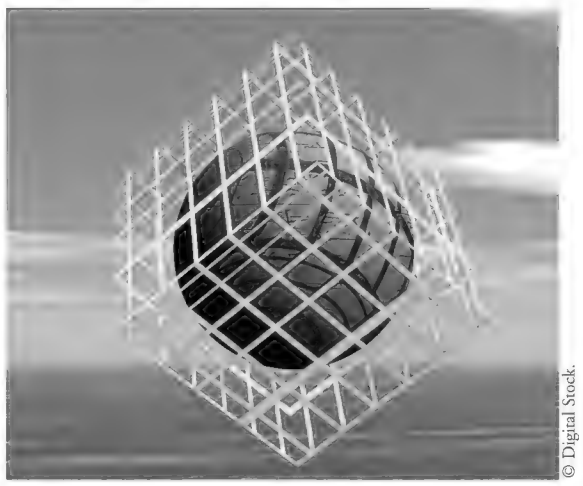

mathematicians. He is Professor of Mathematics and a Distinguished Teaching Professor at The University of Texas at Austin. Professor Starbird has won several teaching awards, most recently the 2007 Mathematical Association of America Deborah and Franklin Tepper Haimo National Award for Distinguished College or University Teaching of Mathematics, which is limited to three recipients annually from the 27,000 members of the MAA.

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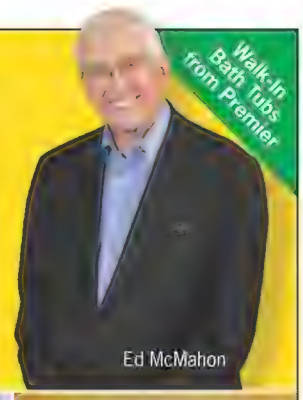

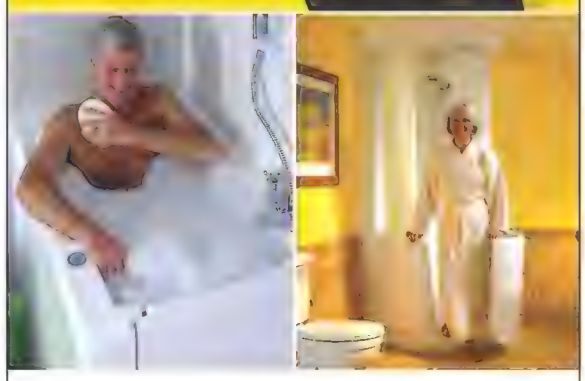

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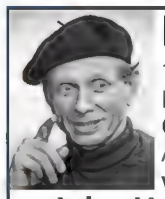

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Evangeline **and its separated lovers gave an epic structure to an American event—and helped launch Longfellow's career.**

Yet in the light of his 200th birthday this month, Longfellow is looking fresh once again. A Library of America edition of his selected writings, published in 2000, has gone through four printings, with close to 37,000 copies in print. To celebrate his bicentennial, the U.S. Postal Service has issued a commemorative stamp—the second to bear his likeness; Herman Melville is the only writer similarly honored. Longfellow was not a "stuffy Victorian," says Christoph Irmscher, curator of a bicentennial exhibit of rare books and other artifacts at Harvard University's Houghton Library. Rather, he was a highly motivated writer who "worked hard to professionalize the business of literature and to earn his status as America's first—and most successful to date—celebrity poet." In his ambition, in his approach to fame and in his connection with his audience, Longfellow can seem, even now, quite contemporary.

HE COULD HAVE BEEN a country lawyer like his father, Stephen, who represented Maine in Congress from 1823 to 1825, but Henry had other ideas. "I most eagerly aspire after future eminence in literature, my whole soul burns most ardently for it, and every earthly thought centres on it," he wrote home during his senior year at Bowdoin College.

Born in Portland, Maine, in 1807, he would cite Washington Irving's *Sketch-*

JOHN FAED / BRIDGEMAN ART LIBRARY; P. 96: JULIA MARGARET CAMERON, MUSEUM OF MODERN ART / SCALA / ART RESOURCE, NY

book of Geoffrey Crayon as the most influential book of his youth. By the time he was 13, he was reading Shakespeare, Samuel Johnson, John Milton, Alexander Pope and Edward Gibbon; he had even published his first poem, "The Battle of Lovell's Pond," in the *Portland Gazette*. His Bowdoin acquaintances included Nathaniel Hawthorne, who would become a lifelong friend, and Franklin Pierce, who would become the 14th president of the United States.

After receiving his bachelor's degree in 1825, Longfellow spent three years in Europe learning French, Italian, Spanish, German and Portuguese, then five years teaching European languages at Bowdoin and translating scholarly texts for classroom use. He had married Mary Storer Potter, a 19-year-old neighbor from Portland, in 1831. Three years later, Harvard College named him Smith Professor of Modern Languages and of Belles Lettres.

To prepare for the job, Longfellow made another trip abroad, this time with Mary. Over the next two years he added Swedish, Danish, Finnish, Old Icelandic and Dutch to his repertoire. But he suffered a grievous loss as well: in 1835 Mary died in Rotterdam after a

Longfellow is only the second writer to grace a U.S. stamp more than once.

miscarriage. It wasn't until 1836 that Longfellow reported to Cambridge, eventually taking a room in an elegant old house on Brattle Street that had served as General Washington's headquarters during the Siege of Boston.

As he had been at Bowdoin, Longfellow was a popular teacher and energetic scholar, introducing his students to the European forms he had mastered while honing his own literary skills. In 1839, he published *Hyperion: A*

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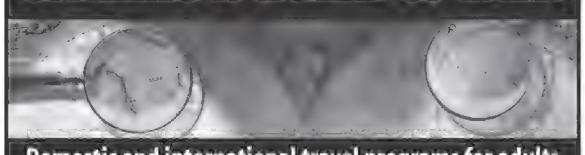

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Romance and *Voices of the Night*, his first collection of poetry, followed in 1841 by *Ballads and Other Poems*. And he married Frances "Fanny" Appleton. Her father, Boston industrialist Nathan Appleton, bought the house on Brattle Street for them as a wedding present.

In 1847, Longfellow published *Evangeline*, the story in verse of an Acadian woman's heartbreaking separation from her bridegroom on their wedding day. It generated six printings in six months. Other successful works followed—*Kavanagh*, a short novel; *The Seaside and the Fireside*, another collection of poetry; and *The Golden Legend*, a medieval tale in verse. By the mid-1850s, he was financially secure enough to leave Harvard and concentrate on writing. In 1857, *The Song of Hiawatha*, arguably Longfellow's best-known poem, sold 50,000 copies, blockbuster numbers for its time. A year after that, *The Courtship of Miles Standish*, a story based loosely on his own Pilgrim ancestors, sold 25,000 copies in the United States within two months—and 10,000 copies in London in a single day. But his sales figures only begin to suggest the impact Longfellow had on 19th-century thought; his books remained in print year after year, and many were translated into no fewer than ten foreign languages.

In *Evangeline*, Longfellow created a character whose experiences were based on the expulsion of French-speaking Acadians from modern-day Nova Scotia by the British in 1755; inspired by the wanderings of Homer's Odysseus and Virgil's Aeneas, he gave an epic structure to a local theme. Similarly, *Miles Standish* and *Hiawatha* brought a human dimension to the lives of the continent's European settlers and its indigenous people—and let Longfellow achieve his goal of explaining America to Americans through poetry.

Moreover, he proved to be a shrewd manager of his literary properties. He insisted that inexpensive paperbacks be made readily available and that his poems be widely reproduced in newspapers and on posters. His image appeared on cigar boxes, beer bottle labels, inkwells, bookends, lithographic

Works such as *The Song of Hiawatha* helped teach the world about America.

engravings, even fine china. His house became a tourist magnet; he kept a stack of autographed cards handy to distribute to the hundreds who came to call. "There is never an hour in the day, when someone is not pounding at the brass knocker of my door," he wrote in a letter to the poet Paul Hamilton Hayne, "never a moment when some unanswered letter is not beckoning to me with its pallid finger."

That grumbling notwithstanding, Longfellow scrupulously answered his mail, sometimes writing up to 20 responses a day. (More than 5,000 were gathered in six volumes published between 1966 and 1982.) He also knew the value of a fascinating new medium, photography: 12,000 images, including many of him and his family, are among the some 800,000 documents, household items, artworks and furnishings maintained by the National Park Service, custodian of his home, called Craigie House, since 1972, when his descendants turned it over to the nation.

Among luminaries to drop by over the years were Mark Twain, Julia Ward Howe, Harriet Beecher Stowe, Anthony Trollope, Ralph Waldo Emerson, Oscar Wilde and singer Jenny Lind; even Dom Pedro II, the emperor of Brazil, came calling. In 1867, Charles Dickens, the most famous novelist on either side of the Atlantic, spent Thanksgiving Day with Longfellow, re-

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newing a friendship they had established 25 years earlier, when Dickens first visited the United States.

Dickens wrote in a letter to his son that Longfellow "is now white-haired and white-bearded, but remarkably handsome. He still lives in his old house, where his beautiful wife was burnt to death. I dined with him the other day, and could not get the terrific scene out of my imagination."

Dickens was referring to Fanny Longfellow's shocking death six years earlier, apparently after her dress was ignited by candle wax as she was sealing an envelope containing a snippet of hair from one of her six children. Longfellow's white beard hid scars from wounds he suffered while trying to smother the flames.

Longfellow and Dickens met again the following year, in England, where the American's whirlwind itinerary included stops at Oxford and Cambridge universities to receive honorary degrees, a stay at the home of Alfred Tennyson, breakfast with Prime Minister William Gladstone and tea at Windsor Castle with Queen Victoria.

"I noticed an unusual interest among the attendants and servants," Victoria later confided to her husband's biographer Theodore Martin. "When [Longfellow] took leave, they concealed themselves in places from which they could get a good look at him as he passed. I have since inquired among them, and am surprised . . . to find that many of his poems are familiar to them. No other distinguished person has come here that has excited so peculiar an interest."

After his death on March 24, 1882, at 75, dozens of memorials were erected throughout the United States. A national campaign was launched to fund a statue to be unveiled in Washington, D.C. In England, Longfellow became the first American to be honored with a marble bust in Poet's Corner at Westminster Abbey. "Never had a poet been so widely loved," Charles Eliot Norton declared in an essay that commemorated the centennial of Longfellow's birth, "never was the death of a poet so widely mourned."

A "beautiful wife," Dickens wrote about Fanny Longfellow after her horrific death.

WIDELY, BUT NOT FOREVER. Longfellow seems to have understood the vicissitudes of fame as well as anyone. His first book of consequence, the travelogue *Outre-Mer: A Pilgrimage Beyond the Seas*, concluded with a prophetic riff: "Dost thou covet fame?" he asked. "This little book is but a bubble on the stream; and although it may catch the sunshine for a moment, yet it will soon float down the swift-rushing current, and be seen no more!"

Still, Longfellow did what he could to hold the sunshine as long as possible. When he died, he even left behind a collection of pencil stubs wrapped in pieces of paper identifying, in his handwriting, the works that he had composed with each one.

"Above all, Longfellow wrote poems that were meant to be enjoyed," says Christoph Irmscher. "Storytelling, unfortunately, goes against the modernist belief that in order to be any good a poem has to be concise and compressed, and difficult to figure out."

Perhaps Longfellow provided his own best summary in "A Psalm of Life":

Lives of great men all remind us
We can make our lives sublime,
And, departing, leave behind us
Footprints on the sands of time.

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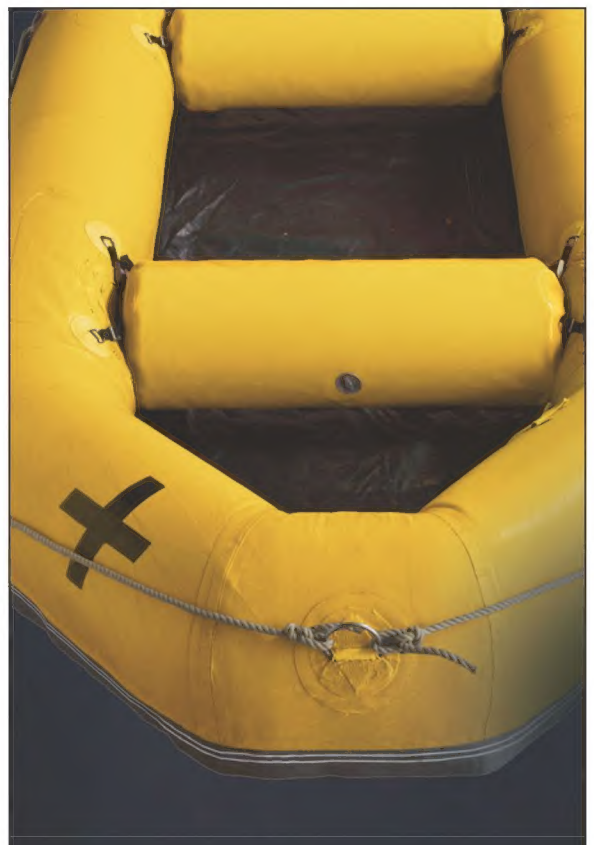

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Juliet: O happy dagger! This is thy sheath—
Romeo (drowsily): What the—?
Juliet: Romeo?
Romeo (disoriented): Am I not dead? Why stab me hence?
Juliet (dropping the dagger): Romeo, oh my love!
Romeo (embracing Juliet): By the heavens, 'tis my fair Juliet!?
Enter APOTHECARY *and* FRIAR LAURENCE.
Apothecary: A thousand pardons, young Romeo. I did by fate or fortune render thy potion for mock death. Here be the vial for eternal sleep.
Romeo: Away grim fellow, and imbibe your witch's brew if you like. I have my life and my Juliet again.
Friar Laurence: Oh, star-crossed lovers, the planets have shifted for thy union! Make haste from this grave cavern, flee to Mantua, and revel in thy marital bliss.

One year later. A modest cottage in Mantua. Sunrise. ROMEO *gazes gloomily upon his teenage wife.*
Romeo (mumbling): Where be my apothecary now?
Juliet (waking): What did you say?
Romeo: Arise my sweetness, my love, my life, and behold the nightingale's fresh breeze upon the morn—
Juliet: Will you can that Elizabethan claptrap? This is the 16th century. Nobody talks like that anymore.
Romeo: This really isn't working out.
Juliet: I've petitioned the pope for an annulment.

Two years later. ROMEO *is putting his head into the oven.*
Romeo: I'll do it! I swear I'll do it!
Juliet: You're bluffing.
Romeo: Does this look like I'm bluffing?
Juliet: You don't have the guts!
Romeo: I did it once. I'll do it again.
Juliet: Will you listen to yourself? Killed yourself *once*? You wouldn't be here, Copernicus!
Romeo: Have you forgotten whose body that was lying over yours in the family crypt?
Juliet: But that poison was fake.
Romeo: I didn't know that!
Juliet: So you say.

Three years later. JULIET *is up a tree, creeping out onto a slender bough.* ROMEO *arrives.*
Romeo: Would you come down from there?
Juliet: Turn away, I don't want your ugly puss to be the last thing I see.
Romeo: I guess I'm on my own for dinner.
Juliet: You're killing me!
Romeo: Where did you put the mutton, honey?
Juliet: This isn't suicide, it's murder!
Romeo: Could you be a little more dramatic?
The bough bends but doesn't break, dropping JULIET *roughly to the ground.*
Romeo: I've got an extra dram of poison. I was saving it for our anniversary.

Five years later. Valentine's Day. A COURIER *from Verona arrives at the couple's front door.*
Courier: A message from the local magistrate. "All secret marriages performed by Friar Laurence in Verona are hereby null and void."
Juliet: How can that be?
Courier: He was just a chef.
The COURIER *races off on horseback.*
Romeo: Get your Sunday clothes on, missy.
Juliet: Where are we going?
Romeo (sings): Goin' to the chapel, and we're gonna get married. . . .

RICHARD THOMPSON